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GRADUATE

Kettering offers graduate programs that cater to the needs of full-time students, young professionals and those looking for a new challenge. A Kettering graduate degree can be obtained in one of three ways: online (<http://catalog.kettering.edu/grad-online>), on-demand digital delivery or on-campus.

The graduate programs that Kettering offers vary based on the medium you wish to pursue your degree. Below is a list of all graduate programs:

Online Delivery

- Engineering Management (p. 14)
- Lean Manufacturing (p. 16)
- Operations Management (p. 17)

Digital Video Delivery (on-demand)

- Business Administration (MBA) (p. 7)
- Electrical & Computer Engineering (p. 10)
- Manufacturing Engineering (p. 12)
- Mechanical Cognate (p. 12)
- Mechanical Design (p. 13)
- Sustainable Energy & Hybrid Technology (p. 14)

On-Campus Delivery

- Automotive Systems (p. 9)
- Electrical Engineering (p. 11)
- Computer Engineering (p. 9)
- Engineering Management (p. 14)
- Operations Management (p. 17)

Click [here](https://www.kettering.edu/graduate-admissions) for more information about admission requirements and deadlines (<https://www.kettering.edu/graduate-admissions>).

ABOUT KETTERING UNIVERSITY

Kettering University is a national leader in experiential STEM (science, technology, engineering and math) and Business education, integrating an intense academic curriculum with applied professional experience. Through this proven approach we inspire students to realize their potential and advance their ideas by combining theory and practice better than any institution in the world. Kettering University is dedicated to achieving the extraordinary through technological innovation, leadership, and service.

Mission, Vision, and Values

Mission

Kettering University prepares students for lives of extraordinary leadership and service by linking transformative experiential learning opportunities to rigorous academic programs in engineering, science, mathematics, and business.

Vision

Kettering University will be the first choice for students and all our partners seeking to make a better world through technological innovation, leadership and service.

Values

Respect: for teamwork, honesty, encouragement, diversity, partnerships with students.

Integrity: including accountability, transparency and ethics.

Creativity: fostering flexibility and innovation.

Collaboration: across disciplines and with all partners.

Excellence: in all we do.

Accreditation

Kettering University Graduate Programs are accredited by The Higher Learning Commission (<http://www.higherlearningcommission.org>) and the Association of Collegiate Business Schools and Programs (ACBSP (<http://www.acbsp.org>)).

History

Originally founded as The School of Automotive Trades by Albert Sobey under the direction of the Industrial Fellowship of Flint on October 20, 1919, Kettering University has a long legacy with the automotive industry. The university became known as the Flint Institute of Technology in 1923 before being acquired by General Motors in 1926, becoming the General Motors Institute of Technology and eventually the General Motors Institute in 1932. Sometimes referred to as the "West Point of industry," GMI focused on creating business and industry leaders through a unique cooperative education model.

GM and the University separated on July 1, 1982, and the University became an independent private university, keeping the cooperative education model and expanding the number of co-op employers for students while also offering graduate programs.

The University's name officially became Kettering University on January 1, 1998, in honor of Charles Kettering (1876-1958), a distinguished engineer, inventor, scientist, social philosopher, and humanitarian. Charles Kettering's belief that both theoretical knowledge and practical

experience are necessary elements of an education made him a staunch advocate for cooperative education in the earliest years of the twentieth century.

While maintaining the cooperative education model it was founded on, Kettering University has expanded programmatic offerings, increased the number of corporate partners and employers to more than 550, and developed a reputation as one of the top applied research institutions in the country. Kettering University's programs and alumni outcomes are consistently among the most highly rated in the United States.

Non-Discrimination Policy Statement

Kettering University, as an equal opportunity/affirmative action employer, complies with all applicable federal and state laws regarding nondiscrimination and affirmative action.

Kettering University is deeply committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, national origin, age, marital status, sex, sexual orientation including gender identity or expression, disability, religion, height, weight, genetic information, or veteran status in employment, educational programs and activities, and admissions except where religion, sex, or age are bona fide job related employment requirements.

Discrimination on the basis of race/ethnicity, color, ancestry, religion, national origin, sex, including marital status, age, disability, or status as a Vietnam-era veteran, special disabled veteran, recently separated veteran or other protected veteran is prohibited by federal and state statutes as amended, including Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, Sections 503 and 504 of the Rehabilitation Act of 1973, the Pregnancy Discrimination Act of 1978, the Age Discrimination in Employment Act of 1978, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, the Americans with Disabilities Act of 1990, and the Civil Rights Act of 1991.

Inquiries or grievances may be addressed to the Director of Human Resources, Office of Human Resources, 1700 University Avenue, Flint, MI 48504, 810-762-9500.

Learning Outcomes

In keeping with its mission, core values, and goals, Kettering University strives to ensure that graduates of its baccalaureate degree programs achieve the following learning outcomes:

- **Communication** – the ability to communicate effectively both orally and in writing
- **Critical thinking** – the ability to reason logically, challenge assumptions, evaluate evidence, use evidence to support a position, and creatively apply knowledge to new situations
- **Quantitative reasoning** – the ability to use mathematical models, concepts, and skills to draw conclusions and solve problems
- **Science** – a knowledge of basic laboratory science and the principles of scientific reasoning
- **Foundation in the liberal arts** – a broad knowledge of the perspectives, content and methods of inquiry, and reasoning in the humanities and social sciences
- **Depth of knowledge in a major field of study** - the content, connections to other disciplines, methods, and distinctive professional requirements of a specific discipline

- **Global awareness** – a knowledge of global societies, respect for other cultures, and the ability to interact effectively across cultural boundaries
- **Teamwork** – the ability to work effectively as a member of a team
- **Leadership** – the ability to provide vision, set direction, and motivate others to follow
- **Ethics** – a knowledge of one’s ethical responsibilities as an individual, a professional, a member of society, and a commitment to their fulfillment
- **Professionalism** – the habits, characteristics, and skills necessary to have a responsible and productive career
- **Entrepreneurial Mindset** – the habits and skills necessary for creative and innovative thinking, awareness of customer needs, and opportunity recognition
- **Lifelong learning** – the habits and skills to sustain and direct lifelong learning, and an appreciation of its importance

Campus Facilities

The seven main buildings, Academic Building, Campus Center, the Connie & Jim John Recreation Center, C. S. Mott Engineering and Science Center, Frances Willson Thompson Hall, the Innovation Center and the University Corner Building, are set off by an attractively landscaped 85-acre campus. In addition, 85+ acres are available for future development.

The Academic Building is the “historical” center of the campus. It houses classrooms, science laboratories, computer laboratories, the library, the Humanities Art Center, McKinnon Theatre, and instructional and administrative offices, comprising a total floor space of nearly 400,000 square feet.

The Campus Center is the “activity” center for the campus. It houses Kettering Dining Services, Sunset C-Store, BJ’s Lounge & Grill, the Wellness Center, television studios, WKUF, Financial Aid, Admissions, Campus Safety, recycling center, student activities areas and other administrative offices.

Kettering’s 70,000 square-foot Connie and Jim John Recreation Center, located just west of the Thompson Residence Hall, has a full complement of aerobic, strength, and sports amenities, in addition to student and alumni lounges, making it the likely focus of many student and alumni social and recreational activities. It houses a six-lane swimming pool, four multi-purpose regulation basketball courts, four racquetball courts, and a 1/8 mile suspended indoor track. Other areas include an aerobics/dance room, a free-weight room, and a fitness/exercise room that overlook the pool and gymnasium.

The C. S. Mott Engineering and Science Center has a total floor space of 130,000 square feet. The building houses Biochemistry, Chemistry, Mechanical Engineering, and alternative energy and automotive laboratories. Student project areas are provided, including the SAE garage.

Frances Willson Thompson Hall is the on-campus residence facility for Kettering University. The facility has four floors, and is designed in a figure eight formation with two courtyards. It is divided into 17 units of 17-37 residents. Common spaces include multiple lounges/lobbies, computer labs, a community kitchen, a gaming area and laundry facilities. Each resident room is equipped with a single bed, desk and chair, wardrobe unit with shelves, and with a micro fridge and microwave. All rooms are air conditioned, heated and have access to telephone,

cable and internet. Most residents share a suite with another resident (two private rooms connected by a door). Residents share community bathrooms, which are located at the intersections of each hallway.

Campus Village Apartments, although not Kettering-operated, are located on Kettering property, and provide suite-style housing for over 200 upper-class students. Students wishing to explore the Campus Village living option should call the Campus Village rental office at (810) 232-4960.

The Innovation Center at Kettering University is an approximately 9,000 sf. multi-tenant laboratory facility that supports scientific and technologically-based “start-up” companies that have a need for dedicated research laboratories in the first three to four years of their existence. It consists of six laboratories that are capable of being divided into twelve intimate laboratories, private offices, a conference/training room, business center, break area and private shower facilities. The Innovation Center is the first Leadership in Energy and Environmental Design (LEED) Silver Certified building in Genesee County.

In addition to the food and catering services provided from the Campus Center, students and the surrounding community have the option of eating at Einstein Bros. Bagels in the University Corner Building across the street from the Campus Center. The 2,500 square-foot building also houses a Flint Police Service Station.

Kettering facilities are accessible to the handicapped. The majority of the campus buildings are inter-connected for ease of movement during inclement weather. Convenient parking is provided adjacent to all campus buildings.

Harris Fields

Harris Fields, adjacent to the Recreation Center, is the 25 acre sports complex for use by Kettering students. The rectangular portion contains areas for two soccer fields or two flag football fields or two lacrosse fields. This section is lit by Musco Lighting, the premier sports lighting company in the world. Softball can be played on 4 fields, complete with backstops and crushed limestone infields. Lacrosse and soccer also utilize the outfields for club practices and games. Informal play, the popular IM Sports program and club sports all utilize Kettering Park. Students, faculty and staff are also active on the .62 mile (1K) walking/jogging path that circumscribes the sports fields.

The McKeachie picnic pavilion is a covered picnic area that features picnic tables, barbeque grilles, lighting and electrical power for student reserved or informal use. Adjacent to the pavilion are two sand volleyball courts that are very popular with students for IM play and pick up games. A synthetic grass golf green completes the outdoor recreational opportunities for students.

Numerous trees and shrubs have been planted and the complex is fenced in and the area bordering University Avenue features faux wrought iron fencing and brick columns offering a distinctive look to one of the entrances to campus. The entire complex provides a first class venue for student recreation.

The Flint River Trail is a paved trail running along the Flint River from downtown Flint to the northern edge of Flint and on to either Bluebell Beach or Stepping Stone Falls. The trail is almost continuously asphalt and is suitable for walking, jogging, and/or biking and passes through the Kettering campus.

Atwood Stadium

Atwood Stadium has been an iconic landmark in the city of Flint for the past 85 years. Built on an old city dump site that was cleared by 3000 local volunteers in a single day, it sits right in the heart of the Flint community. Atwood has played host to many high school football games, including the Flint Northern/Flint Central series. It has also been the venue of choice for large-scale community events, such as visits from President Franklin Delano Roosevelt in 1936 and presidential candidate John F. Kennedy in 1960. Today, activities include all levels of youth football, health fairs, band competitions, and 10k road races.

In September 2013, Kettering University stepped up to the plate and assumed ownership of the venerable stadium in order to keep the facility from closing. Kettering is committed to maintain the traditional uses of the stadium in addition to providing a new venue for Kettering student recreational and academic events. Kettering has performed major upgrades to the facility including a new high-tech synthetic playing surface to replace the outdated existing AstroTurf. The AstroTurf is best in class and enjoyed only by few facilities in the country.

The Kettering University Alumni Carillon (Bell Tower)

The Bell Tower also called Carillon was erected as a part of the campus expansion in 1969, built with funds donated by GMI/Kettering Alumni and friends. At the dedication, it was noted that the structure would “serve as a dynamic symbol of identity between the alumni, students, and faculty”. The carillon consists of 47 bells arranged in four octaves. The largest bell weighs nearly one ton while the smallest bell weighs only 20 pounds. The bells, made of 75 percent copper and 25 percent tin, were cast by the 200-year-old Petit & Fritsen Foundry of Aarle-Rixtel Netherlands. Designed by Tarapata-McMahon-Paulson Associates, the Kettering Carillon received the 1971 Honor Award for design from the Detroit Chapter of the American Institute of Architects.

ACADEMIC CALENDAR

This calendar also exists as a downloadable .pdf file on Kettering University's Academic Calendars Webpage (<https://my.kettering.edu/academics/academic-resources/office-registrar/academic-calendars>).

Academic Calendar 2016-2017										
All dates noted apply to both undergraduate and graduate classes - unless otherwise noted										
Term	Week	Month	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Dates and Events
Summer 2016	1	Jul	3	4	5	6	7	8	9	Jul 7/7-10 A-section new student convocation/orientation
	2		10	11	12	13	14	15	16	Jul 11/11-13 (5pm) Classes begin/late registration and drop add
	3		17	18	19	20	21	22	23	Aug 5 (5pm) Last day for course withdrawal for partial refund
	4	Aug	31	1	2	3	4	5	6	Aug 22 (12noon) Undergraduate student midterm grades due
	5		7	8	9	10	11	12	13	Aug 26 (5pm) Last day for undergraduate course withdrawal - no refund
	6		14	15	16	17	18	19	20	Sept 2-5 Labor Day Break (no classes)
	7		21	22	23	24	25	26	27	Sept 16 (5pm) Last day for graduate course withdrawal - no refund
	8	Sept	28	29	30	31	1	2	3	Sept 20 Last day of classes (follow Friday schedule)
	9		6	7	8	9	10	11	12	Sept 21 Reading day
	10		13	14	15	16	17	18	19	Sept 22-24/24 Final exam period/term ends
	11		18	19	20	21	22	23	24	Sept 30 (12noon) Final grades due
Fall 2016		Oct	25	26	27	28	29	30	31	
	1		2	3	4	5	6	7	8	Sept 29/29-Oct 2 B-section new student convocation/orientation
	2		9	10	11	12	13	14	15	Oct 3/3-5 (5pm) Classes begin/late registration and drop add
	3		16	17	18	19	20	21	22	Oct 28 (5pm) Last day for course withdrawal for partial refund
	4		23	24	25	26	27	28	29	Nov 14 (12noon) Undergraduate student midterm grades due
	5	Nov	30	31	1	2	3	4	5	Nov 18 (5pm) Last day for undergraduate course withdrawal - no refund
	6		6	7	8	9	10	11	12	Nov 24-25 Thanksgiving break (no classes)
	7		13	14	15	16	17	18	19	Dec 9 (5pm) Last day for graduate course withdrawal - no refund
	8		20	21	22	23	24	25	26	Dec 12-13 Follow Thursday/Friday schedule
	9	Dec	27	28	29	30	1	2	3	Dec 13/14 Last day of classes/reading day
	10		4	5	6	7	8	9	10	Dec 15-17/17 Final exam period/term ends
11		11	12	13	14	15	16	17	Jan 3 (12noon) Final grades due	
Winter Break			18	19	20	21	22	23	24	Dec 18-19 Winter break (no classes)
		Jan	1	2	3	4	5	6	7	
Winter 2017	1		8	9	10	11	12	13	14	Jan 9/9-11 (5pm) Classes begin/late registration and drop add
	2		15	16	17	18	19	20	21	Jan 16 Dr. Martin Luther King Jr. Day (no classes)
	3		22	23	24	25	26	27	28	Feb 3 (5pm) Last day for course withdrawal for partial refund
	4	Feb	29	30	31	1	2	3	4	Feb 20 (12 noon) Undergraduate student midterm grades due
	5		6	7	8	9	10	11	12	Feb 24 (5pm) Last day for undergraduate course withdrawal - no refund
	6		12	13	14	15	16	17	18	Mar 3 No classes
	7		19	20	21	22	23	24	25	Mar 17 (5pm) Last day for graduate course withdrawal - no refund
	8	Mar	26	27	28	1	2	3	4	Mar 21 Last day of classes (follow Friday schedule)
	9		5	6	7	8	9	10	11	Mar 22 Reading day
	10		12	13	14	15	16	17	18	Mar 23-25/25 Final exam period/term ends
	11		19	20	21	22	23	24	25	Mar 31 (12noon) Final grades due
Spring 2017		Apr	26	27	28	29	30	31	1	
	1		2	3	4	5	6	7	8	Apr 3/3-5 (5pm) Classes begin/late registration and drop add
	2		9	10	11	12	13	14	15	Apr 28 (5pm) Last day for course withdrawal for partial refund
	3		16	17	18	19	20	21	22	May 15 (12noon) Undergraduate student midterm grades due
	4		23	24	25	26	27	28	29	May 19 (5pm) Last day for undergraduate course withdrawal - no refund
	5	May	30	1	2	3	4	5	6	May 29 Memorial Day break (no classes)
	6		7	8	9	10	11	12	13	Jun 9(5pm) Last day for graduate course withdrawal - no refund
	7		14	15	16	17	18	19	20	Jun 12 Last day of classes
	8		21	22	23	24	25	26	27	Jun 13 Reading day
	9	Jun	28	29	30	31	1	2	3	Jun 14-16/16 Final exam period/term ends
	10		4	5	6	7	8	9	10	Jun 17 Commencement
11		11	12	13	14	15	16	17	Jun 23 (12noon) Final grades due	
Summer Break		Jul	18	19	20	21	22	23	24	Jun 18-Jul 8 Summer break (no classes)

Color key	Late registration/drop add/withdrawal deadlines
	Midterm and final grades due
	No class day
	Reading day
	Final exam period

Approved 04/03/15

ACADEMIC PROGRAMS

Kettering University's graduate programs include several Master's degrees that are offered in a variety of delivery formats to both on and off campus students. While many of our programs are available through distance learning methods to off-campus students, on-campus graduate students can select from many top-quality programs available at our campus in Flint, Michigan. Students can select from programs that are available as part-time evening classes, full-time day classes, or Bachelor/Master offering that allows Kettering University undergraduates to earn a graduate degree.

Kettering University has been offering graduate programs to on and off campus students since 1982. Each program is designed to prepare future leaders for a global workplace with 'first-class education that reflects the real world.' Many students are able to complete a program in less than two years since most programs only require ten core classes for completion (prerequisites and other criteria may apply to some programs). Our graduate programs leverage nationally-ranked faculty who are recognized for their commitment to practical education. Kettering University has long been admired by educational peers and businesses as a leader in developing top engineers and corporate managers.

Master's Degree Programs and Concentrations

1. Business Administration (p. 7) (MBA)
 - Concentrations
 - General
 - Global Leadership
 - Supply Chain Management
 - Technology Management
2. Master of Science in Engineering (MSEN), with a Concentration in:
 - Automotive Systems (p. 9)
 - Computer Engineering (p. 9)
 - Electrical Engineering (p. 11)
 - Electrical & Computer Engineering (p. 10)
 - Manufacturing Engineering (p. 12) (No longer offered after Oct 1st, 2016)
 - Mechanical Cognate (p. 12) (No longer offered after Oct 1st, 2016)
 - Mechanical Design (p. 13) (No longer offered after Oct 1st, 2016)
 - Mechanical Engineering (<http://catalog.kettering.edu/grad/programs/engineering-concentration-mechanical-engr>) (**New** as of Oct 1st, 2016)
 - Sustainable Energy and Hybrid Technology (p. 14) (No longer offered after Oct 1st, 2016)
3. Master of Science in Engineering Management (p. 14) (MSEM)
4. Master of Science in Lean Manufacturing (p. 16) (MSLM)
5. Master of Science in Operations Management (p. 17) (MSOM)

Certificate Programs

- Global Leadership (p. 20)
- Operations Management (<http://catalog.kettering.edu/grad/certificate-programs/ops-management>)

- Supply Chain Management (p. 20)

Masters in Business Administration (MBA)

Home Department: Department of Business (<https://my.kettering.edu/academics/departments/business>)

Available: Classes may be taken through Distance Learning or On Campus

Program Advisor/Contact:

Karen Cayo, Department of Business
810-762-7952
business@kettering.edu

Program Overview

Kettering University's Masters of Business Administration (MBA) program provides students with an educational experience that enable students to perform as effective management professionals and leaders in modern organizations. The MBA consists of 9 core courses (36 credit hours). Students pursuing the MBA must select an area of concentration (3 classes, 12 credit hours) that allows them to customize their MBA program to suit their professional needs. Students may start this program in any term. Also, this program does not have a thesis option.

Program Educational Objectives and Outcomes

The Business Faculty have established the following Objectives and Outcomes for the MBA.

Objective 1

- Graduating students will have an integrated knowledge of business management and demonstrated ability to perform as management professionals. They will be prepared for continued learning through their careers.

Intended Outcome

- Students graduating from the MBA are academically prepared for a business career.

Objective 2

- Students will have the position perspective and skills that create productive employees and managerial leaders.

Intended Outcomes

- Students graduating from the MBA program demonstrate skills required to be productive managerial leaders.

Department of Business Program Policies Participation in Outcome Assessment

As part of the Department of Business Outcome Assessment, students are required to participate in various measurement activities. These include (but are not limited to) taking the ETS Major Field Test at the conclusion of one's academic program.

Pursuing a Second Master's Degree in the Department of Business

The Department of Business encourages interested graduates of Kettering University's MS and MBA programs to pursue a second master's degree subject to the following policies (effective July 1, 2010).

- Students pursue a single master's degree at a time. Students desiring a second master's degree must apply online (<https://www.kettering.edu/graduate-admissions>).
- To earn a second master's degree, students must complete all degree requirements for the degree. In so doing, students must complete additional credit hours equal to a minimum of 40% of the second degree's requirements:
 - For MBA (or MS) graduates pursuing a 10 course MS degree – minimum of four additional courses (16 credits).
 - For MS graduates pursuing a 12 course MBA degree – minimum of five additional courses (20 credits).
- In order to gain maximum advantage from prior course work, graduates must apply for their second master's degree within three years of graduating from their first degree program. The admission committee will review applicants beyond the three-year time limit to establish the currency of their course work. Students in this case may be required to complete more than 40% of the second degree's requirements.
- Students can transfer a maximum of 8 credits to Kettering University for use in their graduate studies. Pursuit of a second master's degree does not raise this limit.

Co-op Work Experience

Co-op work experience is an optional experience for students in any graduate degree program in the Department of Business, subject to the following policies. Co-op work experiences are not required for graduation in any graduate degree program of the Department of Business. For more information on this program, please contact the Department of Business at 810-762-7966, or business@kettering.edu.

- First term – Students can register for co-op work for up to one term after admission to the graduate program and prior to enrolling in their first graduate course.
- Subsequent terms – Students can register for up to two co-op work terms back to back during their graduate studies.
- Final term – Upon completion of course requirements, students can continue to register as a co-op student for one final term.

Transfer Credits

The Department of Business evaluates transfer credits consistent with other sections in this catalog. In addition, the department adheres to the following policies:

- Transfer credits cannot be more than two years old.
- Transfer credits must not have been used for a degree at another institution.

Program Curriculum Requirements

The Curriculum for the MBA involves 12 courses totaling 48 credit hours including:

- nine core course for 36 credits, plus
- three concentration or certificate courses for 12 credits.

Prerequisites

Students entering this program must have completed courses in specified business areas. Students without this background will either be required to complete some or all of the following courses or demonstrate equivalent knowledge by passing an exam. Course Grades are included in the GPA calculation.

ACCT-518	Accounting/Financial Concepts	4
ECON-513	Microeconomic and Macroeconomic Concepts and Applications	4
MGMT-521	Statistical and Quantitative Methods for Managerial Decision	4
MGMT-550	Mgmt Concepts and Applications	2
MRKT-570	Marketing Concepts and Applications	2

Students should review course descriptions for prerequisites and select courses carefully to avoid lacking a prerequisite in future terms. The student is responsible for ensuring prerequisite requirements are satisfied and for completing all courses required for each degree area. Students are offered the option to test out of these prerequisites. Each proficiency test is \$30.00. Students may attempt each test one time only.

Required Courses

ACCT-639	Managerial Accounting	4
BUSN-659	International Business	4
FINC-619	Financial Management	4
ISYS-669	Enterprise Information System Models	4
MGMT-639	Managing People & Organization	4
MGMT-659	Strategy	4
MGMT-661	Operations Management in Service Organizations	4
MRKT-679	Marketing Management	4
BUSN-779	MBA Capstone: Innovation & New Ventures	4

Total Credit Hours		36
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Concentrations & Certificates

General Concentration

(This is a Concentration only.)		
BUSN-689	Organizational Behavior	4
Select two 600-level or above electives from any graduate course in ISYS, IME, MFGO, or MGMT		8
<i>Credit Hours Subtotal:</i>		12

Global Leadership Certificate

BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
<i>Credit Hours Subtotal:</i>		12

Supply Chain Management Certificate

IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4
<i>Credit Hours Subtotal:</i>		12

Operations Management Certificate

IME-676	Lean Six Sigma	4
MGMT-609	Technology Management	4
MGMT-619	Project and Change Management	4
<i>Credit Hours Subtotal:</i>		12

All courses (live and video replay) are available via internet video streaming. Select courses are offered on-campus.

Refer to the Graduate Course Offering Matrices Website (<https://my.kettering.edu/downloads/graduate-course-offering-matrices>) (Department of Business) section for information as to which terms courses are offered. This will allow you to plan when you take each course and complete the program.

MS in Engineering (Concentration in Automotive Systems)

Home Department: Mechanical Engineering (<https://my.kettering.edu/academics/departments/mechanical-engineering>)

Available: Many classes must be completed On Campus

Program Advisor/Contact:

Bassem Ramadan, Ph.D.
810-762-9928
me@kettering.edu (rechempa@kettering.edu)

Program Overview

The Master of Science in Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering/mse-automotive>) is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

The Automotive Systems specialty is intended for individuals who desire a deeper understanding and knowledge of the engineering operations of various systems on vehicles. Courses range from powertrain and engine components to design for safety and comfort. Students select courses from a structured framework in order to customize a program that best meets their individual and career needs. This program has a thesis option.

SAE/Kettering University Partnership

Students who have up to eight (8) Continuing Education Units (CEU) from approved SAE seminars may be eligible transfer those CEU's into the Automotive Systems Masters or Certificate program. For more information you may contact Dr. Bassem Ramadan (<http://catalog.kettering.edu/grad/programs/engineering-concentration->

[automotive-systems/emailto:me@kettering.edu](mailto:me@kettering.edu)) in the Mechanical Engineering Department, or Tom Creech (tcreech@kettering.edu) in the Office of Graduate Studies.

Program Curriculum Requirements

Completion of 40 credits as follows:

Program of Study

Required Courses

MECH-600	Engineering Mathematics with Applications	4
Select at least four courses from the 500 level list below		16
Select at least five courses from the 600 level list below (or three courses and a Thesis)		20
Total Credit Hours		40

500 Level Course Electives (Course prerequisites must be observed.)

MECH-526	Fuel Cell Science & Engineering	4
MECH-540	Introduction to Internal Combustion Engines and Automotive Power Systems	4
MECH-542	Chassis System Design	4
MECH-546	Vehicle Systems Dynamics	4
MECH-550	Automotive Bioengineering: Occupant Protection and Safety	4
MECH-551	Vehicular Crash Dynamics and Accident Reconstruction	4
MECH-5XX	One 500-level technical elective	4

600 Level Course Electives (Course prerequisites must be observed.)

MECH-621	Applied Transport Phenomena	4
MECH-641	Combustion & Emissions	4
MECH-643	Noise, Vibration & Harshness	4
MECH-6XX	Two 600-level technical electives	8
Thesis		8

Refer to the Graduate Course Offering Matrices webpage (<https://my.kettering.edu/downloads/2015-2016-graduate-course-offering-matrices>) for a listing of when courses are offered. This will allow you to plan when you take each course and complete the program. Check the schedule each term or contact the program advisor for availability of the courses.

MS in Engineering (Concentration in Computer Engineering)

Home Department: Electrical and Computer Engineering (<https://my.kettering.edu/academics/departments/electrical-computer-engineering>)

Available: On Campus Only

Program Advisor/Contact:

Dr. Karen Palmer
810-762-9700
ece@kettering.edu (mcdonald@kettering.edu)

Program Overview

The Master of Science in Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering>) is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

The Computer Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering/mse-computer>) concentration is a research-intensive on-campus program designed for individuals who wish to deepen their understanding of computer engineering principles and applications and to develop their skills in independent research.

Graduate Assistantship

Financial support in the form of tuition reductions or waivers and stipends for living expenses is available on a competitive basis. Students who receive financial support may be required to serve as research or teaching assistants for up to 20 hours per week (depending on the level of financial support) during terms in which they are registered.

Program Curriculum Requirements

Completion of 40 credits as follows:

Select four of the following:	16
CE-612 Digital Systems Design	
CE-620 Microcomputer Systems	
CE-622 Computer Architecture and Organization	
CE-624 VLSI Design	
CE-626 Real-Time Embedded Systems	
CE-630 Logic Systems	
CE-642 Mobile Robotics	
CE-670 Haptic Systems	
CE-680 Computer Networks	
CE-682 Computer Embedded Systems	
CE-691 Computer Engineering Special Topics	
CE-699 Computer Engineering Independent Study	
Any 500-600 graduate level elective courses	8
CE-695 Graduate Research in Computer Engineering (two, 8 credit courses)	16
Completion and successful defense of a master's thesis	
Total Credit Hours	40

Undergraduate level coursework might also be required for some students as a prerequisite for either graduate-level coursework or research, depending on the student's background and the nature of the coursework or research. If required, undergraduate-level credit cannot be used to satisfy the graduate-level credit requirements given above.

The program operates on a calendar similar to a conventional quarter system: Fall, Winter, and Spring terms are 'regular' academic terms during which students normally enroll full-time, and the Summer term is optional. The nominal place of student calls for a total of six terms of study over 21 months.

First Year	Fall	8 credits coursework
First Year	Winter	8 credits coursework
First Year	Spring	8 credits coursework
	Summer	
Second Year	Fall	8 credits coursework
Second Year	Winter	8 credits coursework
Second Year	Spring	Thesis defense and submission

Many variations of this plan are possible. In particular, students may begin the program in any term, not just Fall, and may elect to register for coursework or research during Summer. Students may not, however, register for more than eight credits in a term.

MS in Engineering (Concentration in Electrical & Computer Engineering)

Home Department: Electrical and Computer Engineering (<https://my.kettering.edu/academics/departments/electrical-computer-engineering>)

Available: May be completed through Distance Learning or On Campus

Program Advisor/Contact:

Ravi Warriar, Ph.D.
810-762-7847
ece@kettering.edu (kravi@kettering.edu)

Program Overview

The Master of Science in Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering>) is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

The concentration in Electrical & Computer Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate->

degrees/master-science-engineering/mse-electrical-0) is designed for individuals who wish to acquire a deeper understanding and applied knowledge of engineering principles. This program affords a possibility for students to specialize in modern applications of electronics, electrical systems, and computer networking. In addition, the program provides an opportunity to learn business and financial management concepts which are valuable to practicing engineers. This program has a thesis option.

Program Curriculum Requirements

Completion of 40 credits as follows:

ECE-610	Modeling of Dynamic Systems	4
Required -- these six elective courses: ¹		24
ECE-630	Advanced Digital Signal Processing ²	
ECE-642	Electric Machine Drives ²	
ECE-648	Electromagnetic Compatibility ²	
EE-524	Fuel Cell System Integration and Packaging	
EE-530	Digital Control Systems	
EE-582	Robot Dynamics and Control	
Select two of the following: ¹		8
BUSN-659	International Business	
ECON-513	Microeconomic and Macroeconomic Concepts and Applications	
FINC-619	Financial Management	
Free Elective		4
Total Credit Hours		40

¹ **Note:** five of the elective courses must be at the 600-level.

² A student may opt to do an MS thesis for four credits in lieu of a 600-level ECE elective.

Refer to the Graduate Course Offering Matrices Website (<https://my.kettering.edu/downloads/graduate-course-offering-matrices>) (Department of ECE section) for information as to which terms courses are offered. This will allow you to plan when you take each course and complete the program.

MS in Engineering (Concentration in Electrical Engineering)

Home Department: Electrical and Computer Engineering (<https://my.kettering.edu/academics/departments/electrical-computer-engineering>)

Available: On Campus Only

Program Advisor/Contact:

Ravi Warriar, Ph.D.
810-762-7847
ece@kettering.edu (kravi@kettering.edu)

Program Overview

The Master of Science in Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering>) is a professional master's program that builds on

an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

The concentration in Electrical Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering/mse-electrical>) is a research-intensive on-campus program designed for individuals who wish to deepen their understanding of electrical engineering principles and applications and to develop their skills in independent research.

Graduate Assistantships

Financial support in the form of tuition reductions or waivers and stipends for living expenses is available on a competitive basis. Students who receive financial support may be required to serve as research or teaching assistants for up to 20 hours per week (depending on the level of financial support) during terms in which they are registered.

Program Curriculum Requirements

Completion of 40 credits as follows:

ECE-610	Modeling of Dynamic Systems	4
Select three of the following:		12
CE-612	Digital Systems Design	
CE-624	VLSI Design	
ECE-630	Advanced Digital Signal Processing	
ECE-642	Electric Machine Drives	
ECE-648	Electromagnetic Compatibility	
EE-524	Fuel Cell System Integration and Packaging	
EE-530	Digital Control Systems	
EE-582	Robot Dynamics and Control	
EE-691	Graduate Special Topics in EE	
EE-699	Graduate Level Independent Study in Electrical Engineering	
Any 500-600 graduate level elective courses		8
EE-695	Graduate Research in Electrical Engineering (two, 8 credit courses)	16
Completion and successful defense of a master's thesis		
Total Credit Hours		40

Undergraduate-level coursework might also be required for some students as a prerequisite for either graduate-level coursework or research, depending on the student's background and the nature of the coursework or research. If required, undergraduate-level credit cannot be used to satisfy the graduate-level credit requirements given above.

The program operates on a calendar similar to a conventional quarter system: Fall, Winter, and Spring terms are “regular” academic terms during which students normally enroll full-time, and the Summer term is optional. The nominal plan of study calls for a total of six terms of study over 21 months:

First Year	Fall	8 credits coursework
First Year	Winter	8 credits coursework
First Year	Spring	8 credits coursework
	Summer	
Second Year	Fall	8 credits coursework
Second Year	Winter	8 credits coursework
Second Year	Spring	Thesis defense and submission

Many variations of this plan are possible. In particular, students may begin the program in any term, not just Fall, and may elect to register for coursework or research during Summer. Students may not, however, register for more than eight credits in a term.

MS in Engineering (Concentration in Manufacturing Engineering)

Home Department: Industrial and Manufacturing Engineering (<https://my.kettering.edu/academics/departments/industrial-manufacturing-engineering>)

Available: See Notice below.

Program Advisor/Contact:

Dr. Petros Gheresus
Interim Department Head of IME
Room 1-700A, AB, 810-762-7936
ime@kettering.edu (btuttle@kettering.edu)

NOTICE:

This program has been **inactivated, effective July 1, 2016** until further notice; after that date no further enrollments will be accepted. Students currently enrolled in the program will be allowed to complete their degree.

Program Overview

The Master of Science in Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering>) is a professional master’s program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

Program Curriculum Requirements

Completion of 40 credits as follows:

Select ten of the following (4 credits each):	40
IME-563	Safety and Human Factors
IME-564	Ethics and Practice of Engineering
IME-575	Failure Analysis
	Management Elective
	Manufacturing Process Elective(s)
	Industrial and Manufacturing (IME) Elective(s)
	Technical Elective
	Free Elective (or IME-698 Master’s Project)
Total Credit Hours	40

Current courses meeting elective requirements are listed below.

Students may consult the program advisor for the offering of the following courses (due to lack of students/faculty), as well as for additional courses.

Management Electives

Any MGMT course numbered 500 or higher

Process Electives

IME-601	Fundamentals of Manufacturing Engineering	4
IME-603	Numerical Control Machining	4
IME-660	Design for Manufacture and Assembly	4
IME-680	Computer Integrated Manufacturing	4

IME Electives

Any IME course numbered 500 or above

Technical Electives

Any engineering or mathematics course numbered 500 or above

Free Electives

Any graduate course numbered 500 or above

- A student may elect no more than four (4) courses numbered 500-599 to count toward the degree.
- Students following a BS/MS plan will work with their academic advisor to ensure that all requirements are met.

Refer to the Graduate Course Offering Matrices webpage (<https://my.kettering.edu/downloads/2015-2016-graduate-course-offering-matrices>) for a listing of when courses are offered. This will allow you to plan when you take each course and complete the program. Check the schedule each term or contact the program advisor for availability of the courses.

MS in Engineering (Concentration in Mechanical Cognate)

Home Department: Mechanical Engineering (<https://my.kettering.edu/academics/departments/mechanical-engineering>)

Available: May be completed through Distance Learning or On Campus

Program Advisor/Contact:

Dr. Bassem Ramadan
810-762-9928

me@kettering.edu (bramadan@kettering.edu)

NOTE: Effective October 1st, 2016, the **Concentration in Mechanical Cognate will no longer be offered**. Students already pursuing this Concentration may remain and finish their MSE program, or choose to change their concentration to the new Mechanical Engineering Concentration. Contact the Program Advisor with any questions.

Program Overview

The Master of Science in Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering>) is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

This program allows students to develop their own curriculum within a structured framework for the purpose of customizing a degree to meet his/her own needs and career objectives. The student will receive a Master's degree upon completion of ten (10) courses within the program. This program has a thesis option.

Program Curriculum Requirements

Completion of 40 credits as follows:

MECH-600	Engineering Mathematics with Applications	4
Select five Mechanical Engineering Graduate Courses		20
Select three Cognate Courses (see example below)		12
One additional technical elective or a program thesis		4
Total Credit Hours		40

Note: Students can take no more than four (4) 500-level courses.

Example Cognate Courses

If a student desires a cognate in Fuel Cell, the student may select the following courses to satisfy the three cognate courses:

MECH-526	Fuel Cell Science & Engineering	4
MECH-544	Introduction to Automotive Powertrains	4
MECH-545	Hybrid Electric Vehicle Propulsion	4

If a student desires a cognate in Polymers, the student may select the following course to satisfy one of the cognate courses:

MECH-580	Properties of Polymers	4
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Note: Courses must be pre-approved by the Mechanical Engineering Department.

Refer to the Graduate Course Offering Matrices Website (<https://my.kettering.edu/downloads/graduate-course-offering-matrices>) (Department of Mechanical Engineering section) for information as to which terms courses are offered. This will allow you to plan when you take each course and complete the program.

MS in Engineering (Concentration in Mechanical Design)

Home Department: Mechanical Engineering (<https://my.kettering.edu/academics/departments/mechanical-engineering>)

Available: May be completed through Distance Learning or On Campus

Program Advisor/Contact:

Dr. Bassem Ramadan

810-762-9928

me@kettering.edu (bramadan@kettering.edu)

NOTE: Effective October 1st, 2016, the **Concentration in Mechanical Design will no longer be offered**. Students already pursuing this Concentration may remain and finish their MSE program, or choose to change their concentration to the new Mechanical Engineering Concentration. Contact the Program Advisor with any questions.

Program Overview

The Master of Science in Engineering (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering/mse-mechanical-0>) is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.
- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

Students in this program will be provided the skills and knowledge needed to be engineering leaders in modern industry. This program has sound engineering practices supported by the extensive industrial experience of the faculty. The student will receive a Master's degree upon completion of ten (10) courses within the program. This program has a thesis option.

Program Curriculum Requirements

Completion of 40 credits as follows:

FINC-619	Financial Management ¹	4
IME-660	Design for Manufacture and Assembly	4

MECH-516	Introduction to Finite Element Analysis with Structural Applications	4
MECH-600	Engineering Mathematics with Applications	4
MECH-610	Mechanics of Materials I: Linear Elasticity	4
MECH-611	Mechanics of Material II: Nonlinear Elastic-Plastic Behavior	4
MECH-615	Engineering Optimization	4
MECH-643	Noise, Vibration & Harshness	4
Thesis or 600-Level technical elective		4
Technical Elective (may consist of a 500-level course)		4
Total Credit Hours		40

¹ Contact your academic advisor if you have prerequisite issues

Refer to the Graduate Course Offering Matrices Website (<https://my.kettering.edu/downloads/graduate-course-offering-matrices>) (Department of Mechanical Engineering section) for information as to which terms courses are offered. This will allow you to plan when you take each course and complete the program.

MS in Engineering (Concentration in Sustainable Energy and Hybrid Technology)

Home Department: Mechanical Engineering (<https://my.kettering.edu/academics/departments/mechanical-engineering>)

Available: May be completed through Distance Learning or On Campus

Program Advisor/Contact:

Dr. Bassem Ramadan
810-762-9928
me@kettering.edu (bramadan@kettering.edu)

NOTE: Effective October 1st, 2016, the **Concentration in Sustainable Energy & Hybrid Technology will no longer be offered**. Students already pursuing this Concentration may remain and finish their MSE program, or choose to change their concentration to the new Mechanical Engineering Concentration. Contact the Program Advisor with any questions.

Program Overview

The Master of Science in Engineering with concentration in Sustainable Energy & Hybrid Technology (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering/mse-sustainable>) is a professional master's program that builds on an undergraduate engineering program by offering additional depth and greater mastery in a number of technical areas.

Program Objectives

All graduates of the Master of Science in Engineering program will:

- Deepen their knowledge and increase their mastery of technical areas that match their personal career goals.

- Be better prepared to advance in positions of technical and/or managerial leadership.
- Develop their ability to sustain a life-long career in engineering, through continuing self-directed learning and professional development activities.

Program Curriculum Requirements

Completion of 40 credits as follows:

MECH-600	Engineering Mathematics with Applications	4
MECH-526	Fuel Cell Science & Engineering	4
MECH-527	Energy and the Environment	4
MECH-545	Hybrid Electric Vehicle Propulsion	4
MECH-626	Hydrogen Generation, Storage and Safety	4
MECH-627	Green Energy Conversion	4
MECH-641	Combustion & Emissions	4
Select three of the following:		12
BUSN-659	International Business	
EE-524	Fuel Cell System Integration and Packaging	
KETT-540	Environmentally Conscious Design	
MECH-528	Bio and Renewable Energy Lab	
MECH-615	Engineering Optimization	
MECH-621	Applied Transport Phenomena	
Total Credit Hours		40

Refer to the Graduate Course Offering Matrices Website (<https://my.kettering.edu/downloads/graduate-course-offering-matrices>) (Mechanical Engineering section) of this catalog for a listing of when courses are offered. This will allow you to plan when you take each course and complete the program. Check the schedule each term for availability.

MS in Engineering Management

Home Department: Department of Business (<https://my.kettering.edu/academics/departments/business>)

Available: May be completed On Campus (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering-management-0>) or through Kettering University Online (<http://catalog.kettering.edu/grad-online>) (KUO). Current Online students that began the program under a previous Catalog may transition to **Kettering University Online** (<http://catalog.kettering.edu/grad-online>) **under this current Catalog**. Due to the nature of Online courses, all due dates for course assignments are in the Eastern Time Zone regardless of the time zone the student currently resides. KUO has a 24/7 Helpdesk (<http://catalog.kettering.edu/grad-online/information-technology>) available to assist students with technology issues related to Online courses.

Program Academic Advisor/Contact:

Contact the Department of Business
810-762-7952
business@kettering.edu

Program Overview

The Master of Science Engineering Management program (On Campus (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-engineering-management-0>) or Online (<https://online.kettering.edu/programs/masters/engineering-management>) Delivery) prepares graduates to manage technical professionals. It blends education in traditional business topics with technical coursework in engineering. Enrollment is limited to graduates of ABET (<http://www.abet.org>) accredited engineering programs or Kettering University graduates with majors other than management or business.

The Bachelor/Master option is available to all KUO students and for traditional engineering management option. Kettering University BS/MS rules apply. Students in the Kettering University BS/MS Program can **not** study abroad.

Program Educational Objectives and Outcomes

The Business Faculty have established the following Objectives and Outcomes for the MSEM:

Objective 1

- Graduating students will have an integrated knowledge of engineering management and demonstrated ability to perform as management professionals. They will be prepared for continued learning through their careers.

Intended Outcome

- Students graduating from the Master of Science in Engineering Management degree program are academically prepared for a business career.

Objective 2

- Students will have the positive perspectives and skills that create productive employees and managerial leaders.

Intended Outcome

- Students graduating from the Master of Science in Engineering Management degree program demonstrate skills required to be productive managerial leaders.

Department of Business Program

Participation in Outcome Assessment

As part of the Department of Business Outcome Assessment, students are required to participate in various measurement activities. These include (but are not limited to) taking the **ETS Major Field Test** at the conclusion of one's academic program.

Pursuing a Second Masters Degree in the Department of Business

The Department of Business encourages interested graduates of Kettering University's MS and MBA programs to pursue a second master's degree subject to the following policies (effective July 1, 2010):

- Students pursue a single master's degree at a time. Students desiring a second master's degree must apply online (<https://online.kettering.edu/applying>).
- To earn a second master's degree, students must complete all degree requirements for the degree. In so doing, students must complete additional credit hours equal to a minimum of 40% of the second degree's requirements:

- For MBA (or MS) graduates pursuing a 10 course MS degree – minimum of four additional courses (16 credits).
- For MS graduates pursuing a 12 course MBA degree – minimum of five additional courses (20 credits).
- In order to gain maximum advantage from prior work, graduates must apply for their second master's degree within three years of graduating from their first degree program. The admission committee will review applicants beyond the three-year time limit to establish the currency of their course work. Students in this case may be required to complete more than 40% of the second degree's requirements.
- Students can transfer a maximum of 8 credits to Kettering University for use in their graduate studies. Pursuit of a second master's degree does not raise this limit.

Transfer Credits

The Department of Business evaluates transfer credits consistent with other sections in this catalog. In addition, the department adheres to the following policies:

- Transfer credits cannot be more than two years old.
- Transfer credits must not have been used for a degree at another institution.

Program Curriculum Requirements

Completion of 40 credits as follows:

Prerequisites

Students entering this program must have completed courses in specified business areas. Students without this background will either be required to complete some or all of the following courses or demonstrate equivalent knowledge by passing an exam. Course Grades are included in the GPA calculation.

ACCT-518	Accounting/Financial Concepts	4
ECON-513	Microeconomic and Macroeconomic Concepts and Applications	4
MGMT-521	Statistical and Quantitative Methods for Managerial Decision	4
MGMT-550	Mgmt Concepts and Applications	2
MRKT-570	Marketing Concepts and Applications	2

Students should review course descriptions for prerequisites and select courses carefully to avoid lacking a prerequisite in future terms.

The student is responsible for ensuring prerequisite requirements are satisfied and for completing all courses required for each degree area. Students have the opportunity to test out of prerequisite courses. Each test will cost \$30.00. Students may attempt each test one time only.

KUO Program of Study- MS in Engineering Management

Required Courses

BUSN-659	International Business	4
FINC-619	Financial Management	4
ISYS-669	Enterprise Information System Models	4
MGMT-639	Managing People & Organization	4
MGMT-659	Strategy	4
MRKT-679	Marketing Management	4
IME-564	Ethics and Practice of Engineering	4

Certificate

Select three 4-credit courses in one of the Certificate areas listed below.	12
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Total Credit Hours	40
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Global Leadership Certificate

BUSN-689	Organizational Behavior	4
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MGMT-649	Ethics and Leadership	4
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MGMT-679	Leadership	4
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Total Credit Hours	12
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Operations Management Certificate

IME-676	Lean Six Sigma	4
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MGMT-609	Technology Management	4
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MGMT-619	Project and Change Management	4
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Total Credit Hours	12
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Supply Chain and ERP Certificate

IME-652	Designing Value in the Supply Chain	4
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IME-654	Enterprise Resource Planning	4
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MGMT-669	Supply Chain Operations	4
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Total Credit Hours	12
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On-Campus Program of Study- MS in Engineering Management**Required Courses**^{1,2}

BUSN-659	International Business	4
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FINC-619	Financial Management	4
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IME-564	Ethics and Practice of Engineering	4
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ISYS-669	Enterprise Information System Models	4
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MGMT-639	Managing People & Organization	4
----------	--------------------------------	---

MGMT-659	Strategy	4
----------	----------	---

MRKT-679	Marketing Management	4
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Total Credit Hours	28
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Global Leadership Certificate³

BUSN-689	Organizational Behavior	4
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MGMT-649	Ethics and Leadership	4
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MGMT-679	Leadership	4
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Total Credit Hours	12
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Operations Management Certificate

IME-676	Lean Six Sigma	4
---------	----------------	---

MGMT-609	Technology Management	4
----------	-----------------------	---

MGMT-619	Project and Change Management	4
----------	-------------------------------	---

Total Credit Hours	12
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Supply Chain and ERP Certificate

IME-652	Designing Value in the Supply Chain	4
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IME-654	Enterprise Resource Planning	4
---------	------------------------------	---

MGMT-669	Supply Chain Operations	4
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Total Credit Hours	12
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¹ Study Abroad credits cannot be applied to this core courses set.

² Students admitted to the Kettering BS/MS program can count up to two (2) 500-level courses taken as an undergraduate.

³ Students affiliated with the SACM program are not allowed to enroll in this certificate.

The degree also has a study-abroad option that allows students to experience German culture and receive up to 16 credits of graduate course work.

Refer to the Graduate Course Offering Matrices (Department of Business) section of this catalog for a listing of when courses are offered. This will allow you to plan when you take each course and complete the program. Check the schedule each term for availability.

MS in Lean Manufacturing

Home Department: Kettering University Online (<https://online.kettering.edu/programs>)

Available: Only available through Kettering University Online (<http://catalog.kettering.edu/grad-online>).

Program Advisor/Contact:

Contact Kettering University Online
kuonline@kettering.edu
810.762.9827

Program Overview

The Master of Science in Lean Manufacturing (<https://online.kettering.edu/programs/masters/lean-manufacturing>) program concentrates on the key elements of lean agile manufacturing operations. Students in this program can expect to complete in-depth studies of systems, processes and practices in manufacturing facilities. This discipline gives students exposure to many elements of manufacturing including lean production systems, work analysis, materials handling, quality systems, manufacturing and management metrics, as well as cutting-edge practices such as lean and agile manufacturing. The degree aims to enhance the student's technical skills with lean methodology and analysis techniques as well as management skills to complement their technical ability, enabling the student to take a broader perspective on the manufacturing industry as a whole.

Program Educational Objective

- Develop and implement lean and competitive manufacturing facilities
- Apply appropriate quality systems tools
- Implement and evaluate suitable production control systems
- Identify and implement the requirements of a successful supply chain
- Develop a skill set to identify and manage 'change' effectively

Program Outcomes

The program is intended for individuals in manufacturing who aspire to have a more comprehensive knowledge in lean and agile manufacturing operations and practices. Graduates of this program can expect to possess a thorough understanding of manufacturing methods, analytical methods to make decisions within a manufacturing facility, and innovation skills to adapt to changes within the global/cross-cultural environment. This program does not require a thesis.

Program Curriculum Requirements

Completion of 40 credits as follows:

Required Courses

MFGO-601	Globally Integrated Manufacturing Company	4
MFGO-619	Six Sigma for Manufacturing	4
MFGO-633	Lean Production Systems	4
MFGO-635	Work Analysis for Lean Production Application	4
MFGO-639	Quality Assurance and Reliability	4
MFGO-649	Metrics for Lean Production Improvement	4
MFGO-659	Integrative Capstone Project	4

Certificate

Select three 4-credit courses in one of the Certificates listed below.	12
Total Credit Hours	40

Global Leadership Certificate

BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
Total Credit Hours	12	

Operations Management Certificate

IME-676	Lean Six Sigma	4
MGMT-609	Technology Management	4
MGMT-619	Project and Change Management	4
Total Credit Hours	12	

Supply Chain and ERP Certificate

IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4
Total Credit Hours	12	

MS in Operations Management

Home Department: Department of Business (<https://my.kettering.edu/academics/departments/business>)

Available: May be completed On Campus (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-operations-management-0>). Current students may transition to Kettering University Online (<http://catalog.kettering.edu/grad-online>).

New off-campus students will be registered into Kettering University Online (<http://catalog.kettering.edu/grad-online>).

Program Advisor/Contact:

Contact the Department of Business
810-762-7952
business@kettering.edu

Program Overview

The Master of Science in Operations Management (MSOM) program (On Campus (<https://my.kettering.edu/academics/departments/graduate-programs/graduate-degrees/master-science-operations-management-0>) or Online Delivery (<https://online.kettering.edu/programs/masters/>

operations-management)) focuses on the management skills, knowledge, and attitudes required to lead organizations that create goods and services. Students in this program will gain expertise in general business management areas, as well as a firm understanding of methods and practices in modern operations management. Students currently in this program possess a wide variety of backgrounds and undergraduate degrees. The Department of Business designed this program for people who currently are in — or desire to enter — a management position within a manufacturing or services company. This program does not require a thesis.

Program Educational Objectives and Outcomes

The Business Faculty have established the following Objectives and Outcomes for the MSOM:

Objective 1

- Graduating students will have an integrated knowledge of operations management and demonstrated ability to perform as management professionals. They will be prepared for continued learning throughout their career.

Intended Outcome

- Students graduating from the Master of Science in Operations Management degree program are academically prepared for a business career.

Objective 2

- Students will have the positive perspectives and skills that create productive employees and managerial leaders.

Intended Outcome

- Students graduating from the Master of Science in Operations Management degree program demonstrate skills required to be productive managerial leaders.

Department of Business Policies**Participation in Outcome Assessment**

As part of the Department of Business Outcome Assessment, students are required to participate in various measurement activities. These include (but are not limited to) taking the **ETS Major Field Test** at the conclusion of one's academic program.

Pursuing a Second Masters Degree in the Department of Business

The Department of Business encourages interested graduates of Kettering University's MS and MBA programs to pursue a second master's degree subject to the following policies (effective July 1, 2010):

- Students pursue a single master's degree at a time. Students desiring a second master's degree must apply online (<https://online.kettering.edu/applying>).
- To earn a second master's degree, students must complete all degree requirements for the degree. In so doing, students must complete additional credit hours equal to a minimum of 40% of the second degree's requirements:
 - For MBA (or MS) graduates pursuing a 10 course MS degree – a minimum of four additional courses (16 credits).
 - For MS graduates pursuing a 12 course MBA degree – a minimum of five additional courses (20 credits).
- In order to gain maximum advantage from prior work, graduates must apply for their second master's degree within three years

of graduating from their first degree program. The admission committee will review applicants beyond the three-year time limit to establish the currency of their course work. Students in this case may be required to complete more than 40% of the second degree's requirements.

- Students can transfer a maximum of 8 credits to Kettering University for use in their graduate studies. Pursuit of a second master's degree does not raise this limit.

Transfer Credits

The Department of Business evaluates transfer credits consistent with other sections in this catalog. In addition, the department adheres to the following policies:

- Transfer credits cannot be more than two years old.
- Transfer credits must not have been used for a degree at another institution.

Program Curriculum Requirements

Completion of 40 credits as follows:

Prerequisites

Students entering this program must have completed courses in specified business areas. Students without this background will either be required to complete some or all of the following courses or demonstrate equivalent knowledge by passing an exam. Course grades are included in the GPA calculation.

ACCT-518	Accounting/Financial Concepts	4
ECON-513	Microeconomic and Macroeconomic Concepts and Applications	4
MGMT-521	Statistical and Quantitative Methods for Managerial Decision	4
MGMT-550	Mgmt Concepts and Applications	2
MRKT-570	Marketing Concepts and Applications	2

Students should review course descriptions for prerequisites and select courses carefully to avoid lacking a prerequisite in future terms. The student is responsible for ensuring prerequisite requirements are satisfied and for completing all courses required for each degree area. Students may wish to test out of these prerequisites. Each test is \$30.00. Students may attempt each test one time only.

KUO Program of Study- MS in Operations Management

Required Courses

FINC-619	Financial Management	4
ISYS-669	Enterprise Information System Models	4
MGMT-629	Management Science	4
MGMT-639	Managing People & Organization	4
MGMT-661	Operations Management in Service Organizations	4
MRKT-679	Marketing Management	4
MGMT-659	Strategy (Capstone)	4

Certificate

Select three (3) 4-credit courses in one of the certificate areas listed.	12
Total Credit Hours	40

Global Leadership Certificate

BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
Total Credit Hours	12	

Operation Management Certificate

IME-676	Lean Six Sigma	4
MGMT-609	Technology Management	4
MGMT-619	Project and Change Management	4
Total Credit Hours	12	

Supply Chain and ERP Certificate

IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4
Total Credit Hours	12	

On-Campus Program of Study- MS in Operations Management

Required Courses

FINC-619	Financial Management	4
ISYS-669	Enterprise Information System Models	4
MGMT-629	Management Science	4
MGMT-639	Managing People & Organization	4
MGMT-659	Strategy	4
MGMT-661	Operations Management in Service Organizations	4
MRKT-679	Marketing Management	4

Certificate

Select three (3) 4-credit courses in one of the two certificate areas listed. ¹	12
Total Credit Hours	40

Global Leadership Certificate²

BUSN-689	Organizational Behavior	4
MGMT-649	Ethics and Leadership	4
MGMT-679	Leadership	4
Total Credit Hours	12	

Operation Management Certificate

IME-676	Lean Six Sigma	4
MGMT-609	Technology Management	4
MGMT-619	Project and Change Management	4
Total Credit Hours	12	

Supply Chain and ERP Certificate

IME-652	Designing Value in the Supply Chain	4
IME-654	Enterprise Resource Planning	4
MGMT-669	Supply Chain Operations	4
Total Credit Hours	12	

¹ Students admitted to the Kettering BS/MS program can count up to two (2) 500-level courses taken as an undergraduate. In addition, students need to an additional 600-level course for a total of three (3).

² Students affiliated with the SACM program are not allowed to enroll in this certificate.

Refer to the Graduate Course Offering Matrices (Department of Business) section of this catalog for a listing of when courses are offered. This will allow you to plan when you take each course and complete the program. Check the schedule each term for availability.

CERTIFICATE PROGRAMS

Kettering University has designed a set of graduate certificate programs for students that want to update their skill set in a new area of study. For students who do not have a graduate degree in hand, a graduate certificate can be the beginning of work toward a master's degree. For students who already hold a Masters degree, a certificate program can provide graduate level education in an additional area of concentration.

Certificate Programs

- Global Leadership (p. 20)
- Operations Management (<http://catalog.kettering.edu/grad/certificate-programs/ops-management>)
- Supply Chain Management (p. 20)

All graduate certificates require a minimum of three graduate level courses. No more than two five hundred (500) level courses may be included in the certificate. The three courses must apply to a particular graduate degree and all count for credit in that degree. (Note: An engineering department may elect to have the certificate as part of the MBA concentrations instead of a specific engineering concentration.)

Students must meet admission requirements for a graduate program to be accepted to the graduate certificate.

Pre-requisite requirements must be met for the courses in a graduate certificate or must be waived by the offering department. If pre-requisites are waived for the graduate certificate program, they will also be waived if the student decides to pursue a complete graduate degree, however, there may be other pre-requisites required for a complete program admission.

Graduate tuition will be paid for graduate certificate programs. Students may take the classes through on-campus or distance learning offerings as available. (Note: The exception may be undergraduate Kettering students who might take the classes for either graduate or undergraduate credit. They would be paying undergraduate tuition rates.)

Global Leadership

Department of Business

Admissions basis: MBA

BUSN-659	International Business	4
MGMT-639	Managing People & Organization	4
Select one of the following:		4
BUSN-689	Organizational Behavior	
MGMT-649	Ethics and Leadership	
MGMT-679	Leadership	

Supply Chain and ERP

Department of Business

Admissions basis: MBA/MSOM

IME-654	Enterprise Resource Planning	4
IME-652	Designing Value in the Supply Chain	4
MGMT-669	Supply Chain Operations	4

COURSE DESCRIPTIONS

The course numbers **591 and 691** shall be used to describe special topics courses. Special topics courses are one-time offerings whose content is determined by current faculty interest. These courses may be repeated for credit when the course is run with different content.

The course numbers **597 and 697** shall be used to admit credit for transfer or guest courses that are not equivalent to existing Kettering courses within a discipline. These course numbers are not used for study abroad transfer credit.

The course numbers **598 and 698** shall be used to describe transfer courses taken as part of a Kettering University International Studies Program.

The course numbers **599 and 699** shall be used to describe an independent study course. Independent study is student-directed exploration with faculty guidance at an advanced level. This course may be repeated for credit when the course is run with different content.

ADMISSIONS

To be admitted into Kettering University as a Graduate Student, a prospective student must select a graduate degree program, fulfill all specific admission requirements as laid out for each graduate degree program, complete an online application, and arrange for official transcripts to be sent to Kettering University from all universities/colleges previously attended, either electronically or by mail. A Bachelor degree from a regionally accredited U.S. university/college or its equivalent is required for acceptance into a graduate program.

Admission into a graduate program is offered once the application process is complete, and has been appropriately evaluated. Applications will not be reviewed before completion and all necessary documents submitted. Applicants will thereafter be notified of either acceptance or denial. If granted program admission, the student may then proceed to register for class and matriculate. Kettering does not discriminate by reason of race, color, sex, creed, age, physical challenge or national origin.

Kettering University has rolling admissions. Applications may be submitted at any time. Program start dates will be determined based on date of acceptance and program availability. Not all programs allow admission every term - see specific program description.

Admission Requirements

Grade Point Average

Regular admission requires an individual to possess a minimum undergraduate overall grade point averages of 3.0 on a 4.0 Grading System, or international equivalent.

Transcripts

All students applying for admission must submit an official copy of their undergraduate transcripts from an accredited U.S. college or university. An 'official transcript' is an unopened, original transcript mailed directly from the previous college to Kettering University. International students are required to submit a credential evaluation. The evaluating body must be a member of the National Association of Credential Evaluation Services (NACES). This will be at the expense of the student. Kettering University undergraduate students do not need to submit their Kettering transcripts, but are required to submit transcripts from any other university.

On-Campus Graduate Programs

The following Master programs are available on-campus for Kettering University:

- Master of Business Administration (MBA) – with concentrations**
- Master of Science in Engineering (MS) – with concentrations**
- Master of Science in Engineering Management (MS)**
- Master of Science in Operations Management (MS)**

Additional program requirements:

For MS in Engineering Applicants

MS in Engineering applicants must submit a completed application, two letters of recommendation, and official transcripts of their Bachelor's degree in an engineering discipline from an ABET-accredited program. Engineering Technology degrees will not be considered for the Engineering programs.

GRE General Section is also required for applicants to the Master of Science Engineering program. GRE scores more than five years old are not valid. Kettering University's institution code is 1246. If asked to choose a department code, please choose the one that best fits your intended program. All scores are sent directly to the admissions office regardless of the department code selected. For graduates of Kettering University the GRE required will be waived.

For MS in Engineering Management Applicants

Engineering Management applicants must have a Bachelor of Science degree in Engineering from an approved ABET-accredited engineering (not technology) or computing program, or be a Kettering University graduate with a degree other than management or business.

MS in Operations Management Applicants

Applicants for the MSOM degree program must submit official transcripts of their Bachelor's degree from a regionally-accredited U.S. university or an international equivalent.

For Applicants of the on-campus MBA program, the Engineering Management program, and the Operations Management program

Students entering these programs must have completed specific prerequisite undergraduate courses. These courses must have been passed with a C or better. Applicants who do not have this background may either complete the required prerequisite courses through Kettering University in these areas or demonstrate their knowledge by successfully passing appropriate qualifying exams at Kettering University. Contact the Department of Business (business@kettering.edu) about the qualifying exam.

Kettering University Online Graduate Programs

The following programs are available through Kettering University Online (KUO):

- Master of Operations Management**
- Master of Engineering Management**
- Master of Lean Manufacturing**

Contact Kettering Global Offices (<https://online.kettering.edu>) for specifics.

Domestic Applicants

If you are a citizen or Permanent Resident of the United States, use the admissions checklist below to assist you in completing your admission packet. Refer to the specific degree program admission requirements in this catalog to ensure that you include all necessary materials for your desired program.

- **Application for Admissions**
Apply online (<https://www.kettering.edu/undergraduate-admissions>):
There is no application fee for applicants.
- **Official Transcripts**
Request all official transcripts (unopened, original transcripts from all undergraduate studies) to be mailed directly from your previous college/university to Kettering University Admissions Office. Engineering applicants must possess a degree in an engineering discipline from an ABET-accredited program. Engineering Technology degrees will not be considered for engineering programs.

- **Letters of Recommendation**

Two letters of recommendation are required for the MS in Engineering programs.

- **GRE General Section Test**

Submit electronically or mail information to:

admissions@kettering.edu

Admissions Office
Kettering University
1700 University Avenue
Flint, MI 48504-6214

Notification of Admission

Applicants will be notified by personal letter or email of the Admissions Committee's decision by personal letter or email. Once Kettering University has received your application and all supporting documents, please allow approximately four weeks for processing and to receive notification.

International Applicants

Please follow these instructions if you are not a citizen or Permanent Resident of the United States. This convenient checklist can assist you in completing your admissions packet. To ensure that you include all necessary materials for your desired program, refer to the specific degree program admission requirements in this catalog. An admission decision will only be made for students who have completed their undergraduate program.

- **Application for Admissions**

Apply online: There is no application fee for applicants.

- **Official Transcripts from U.S. undergraduate institutions**

Students who has completed their Bachelor's degree in the U.S. must request all official transcripts be sent directly to Kettering University from all previously attended colleges/universities. The minimum Grade Point Average (GPA) for full admission is 3.0 on a 4.0 scale, or the International equivalent. Engineering and Engineering Management program applicants must possess a degree in an engineering discipline from an ABET-accredited program, or an international equivalent.

- **Copy first page of passport**

All application packets should contain a copy of the prospective student's passport, if available.

- **English Language Proficiency**

Applicants whose native language is not English and who have not earned a Bachelor's degree from a U.S. institution are required to take TOEFL, International English Language Testing System (IELTS), MELAB (offered by University of Michigan), or complete level 112 at an approved ELS center. Please have official scores sent to Kettering University's Office of Graduate Studies, Code 1246. Photocopies will not be accepted. Our minimum score requirements are: TOEFL: Paper-based: 550, Computer-based: 213, Internet-based: 79; IELTS: Minimum Ban score of 6.0; MELAB: 76

- **Statement of Financial Support On Campus Programs**

International student applicants must document their ability to meet all educational expenses for the entire period of intended study. Neither scholarship funds nor financial aid are available for international students at Kettering University. You will need to provide an Affidavit of Financial Support (<http://www.kettering.edu/downloads/graduate-international-affidavit-financial-support>).

- **Letter of Recommendation**

Two letters of recommendation are required for the MS in Engineering program.

- **GRE General Section Test**

Mail information to:

Admissions Office
Kettering University
1700 University Avenue
Flint, MI 48504-6214

admissions@kettering.edu

On-Campus International Students Notification of Admission

International Applicants will be notified by email of the Admission Committee's decision. Once all materials are received at Kettering University, please allow approximately four weeks for processing your application and to receive notification.

Note: This decision simply grants or denies admission into the graduate program. Issuing an I-20 is a separate process and may require additional information. For information regarding the I-20 process, contact the Office of International Programs at international@kettering.edu or (810) 762-9801.

Financial Aid for On Campus and KUO Students

Several financial aid programs exist for on-campus and Kettering University Online students. Loans may be available. Students who contemplate applying for financial aid should contact that Financial Aid Office for further information at: 800-955-4464 ext. 7859 or finaid@kettering.edu.

Financial Aid Eligibility

- Must be at least half-time or more to be considered for aid
- Certificate courses are not eligible for aid - cost of certificate course is not included in the Cost of Attendance when determining financial aid package
- Students who receive tuition assistance or reimbursement from their employer should contact their financial aid advisor

Cost of Attendance (COA)

- COA values are based on assumed enrollment for the 16-17 academic year
- Kettering Online students are budgeted with tuition and books only

Federal Direct Loan

There are two types of Federal Direct Loans that graduate students may receive:

1. **Direct Unsubsidized Loans** – Eligible students may borrow up to \$20,500 per school year
2. **Direct PLUS Loans** – Eligible graduate students who need to borrow more than the maximum unsubsidized loan amounts to meet their education costs may apply for a PLUS loan. A credit check will be performed during the application process.

In order to qualify for the Direct Loan, students must first complete the FAFSA (Free Application for Federal Student Aid) and submit all requested documents to the Financial Aid Office.

International students do not qualify for U.S. Federal loans.

Alternative Loans

Alternative loans (private student loans offered by various lenders) are another source of financing your educational costs. These loans are based on credit approval, and interest begins accruing upon disbursement of the loan. Each loan has different terms, borrowing limits, interest rates, and other special criteria. Additional information on Alternative Loans can be found on this website (<https://choice.fastproducts.org/FastChoice/home/226200/1>).

International Applicants for On-Campus Programs

Neither scholarship funds nor financial aid through Kettering University are available for international students.

International applicants must demonstrate and provide evidence of their ability to meet all educational and living expenses (tuition, room and board, etc.) for the entire period of their intended stay before Kettering University can issue a Certificate of Visa Eligibility (Form I-20). Evidence may include a statement from a legitimate financial institution reflecting a minimum of \$45,536 (U.S. dollars) in a savings account to pay expenses while attending Kettering University. Medical insurance, including repatriation and evacuation coverage, is required for all international students and must be purchased through Kettering University.

Prior to registering for classes, full payment for tuition must be made for the term in which the student is enrolling. Funds remitted or provided for payment must be drawn from a U.S. Bank.

International Applicants for Kettering University Online

There is no application fee for international students taking exclusively online programs. No evidence of financial ability is required. Students who do not pay for classes are barred from further registration.

Graduate Assistantship for On Campus Programs

A limited number of teaching assistantships and research assistantships are available for resident students. These are awarded on a competitive basis.

An applicant must meet all admission requirements and be fully admitted in order to be eligible for an assistantship. The major departments select assistants according to the qualifications of the applicants and the needs of the departments. Applicants who are interested in being considered for a graduate assistantship should contact the degree granting department when notification of full admittance has been received. Kettering University does not discriminate by reason of an individual's race, color, sex, creed, age, handicap, or national origin.

Please note that not all graduate degree programs are available for assistantships within specific departments. The department sponsoring the assistantship has final approval and may require a specific major.

Graduate Satisfactory Academic Progress (SAP)

In order to receive Student Financial Aid under the programs authorized by Title IV of the Higher Education Act, as amended, a student must be maintaining satisfactory academic progress in the course of study that he/she is pursuing.

Minimum cumulative grade-point average (GPA): Graduate students must maintain a minimum cumulative GPA of 3.0

Maximum time frame for degree completion: For degree completion, students who exceed 150% of the normal period to complete their academic programs are not eligible for additional Title IV assistance for the period that is in excess of 150% of the academic period normally required to complete the program of study.

Financial Aid Warning

Graduate students will be evaluated at the end of each academic term to determine if the student is meeting the standards described above. Graduate students who fail to meet the minimum 3.0 cumulative grade point average standard will be placed on Financial Aid Warning for the subsequent semester/period of enrollment. Financial aid can be received during the semester/term of warning. Financial aid disbursement for the next period of enrollment will be held until grades have been reviewed for the warning semester/period of enrollment of Financial Aid Warning; he/she must successfully complete the term without any failures, incompletes, or withdrawals.

Financial Aid Suspension

The Financial Aid Office will review the records of students who are on financial aid warning at the end of the term that are placed on warning. If the student is still not meeting the minimum cumulative grade point average (3.0), the student will forfeit eligibility for all federal and institutional financial aid programs.

Financial aid will be suspended until the student successfully meets the cumulative grade point average standards. The student is responsible for paying his/her own expenses, such as tuition, fees, books, supplies, etc. and will not be reimbursed for the period(s) of financial aid suspension.

Right to Appeal

Students have the right to appeal any decision of ineligibility to continue to receive financial assistance unless they have previously been granted an appeal. Appeals must be filed within 30 days of notification that aid eligibility has been lost.

An appeal should be based upon some unusual situation or condition which prevented you from passing more of your courses, or which necessitated that you withdraw from classes. Examples of possible situations include documented serious illness, severe injury, or death of a family member.

TUITION AND FEES

Expenses

The current tuition, fees, and charges are listed below. The Student Accounts Office will send an email notification to your Kettering email when your official bill is ready to view on Banner Web/Self Service.

We have teamed with Nelnet Business Solutions (NBS), to enable you to pay your education expenses through an online payment site - NBS Payments. NBS gives you the option of making a single payment or to sign up for a payment plan. Payments are processed via direct debit from a bank account or credit card. Please visit NBS Payments for more information – www.kettering.edu/nbs.

A \$40 late fee and a financial hold will be added to all accounts which have not been settled in full by the end of each academic term.

Tuition for the 2016-2017 Academic Year

Graduate Tuition (per credit hour)	\$857
2-credit course	\$1,714
4-credit course	\$3,428

Business Related Fees

NSF Check Processing Fee	\$25
Graduate Late Payment Fee	\$40
Graduate Credit by Proficiency Exam Fee	\$30
Graduate Transfer or Credit Posting Fee (per credit hour)	\$5
Graduate Graduation Fee	\$160
Graduate Enrollment Deposit (International Students Only)	\$350

When registering via the web, students acknowledge enrollment in the course(s) selected and authorizes Kettering University to bill them for any related tuition and fees. Payment is due the first day your course begins. A 'hold' will be placed on the account at the end of each academic term for those students who have not paid their tuition, submitted a voucher, or enrolled in the NBS payment plan; this will prevent future course registrations/course cancellations and may result in a late fee, and grade reports and transcripts being withheld.

Employer Assistance

Many employers provide financial assistance for graduate study. Programs differ, so interested students should contact the appropriate office at their place of employment. Depending on company policy, Kettering University may be able to bill the employer directly for tuition. Students whose tuition is to be billed to their employers must submit complete and proper authorization to Kettering University. Students should apply for their employer tuition assistance as soon as possible – since costs and course offerings are known in advance. **Any portion of tuition that will not be paid by the employer must be paid by the student.** Kettering University will hold the student responsible for payments not received from the employer.

Tuition Refund Policy for On Campus Programs

Specific refund dates for each term are available at www.kettering.edu/registrar (<http://www.kettering.edu/registrar>).

Course withdrawals and associated refunds are initiated by completing a Graduate Program Course Withdrawal Form (<https://my.kettering.edu/sites/default/files/resource-file-download/IAGradCourseWithdrawalForm.pdf>) and submitting it the Office of the Registrar for processing. The date the form is received in the Office of the Registrar determines the refund amount. Students are personally responsible for submitting the forms and verifying their receipt by the University. Refunds are made to the payer of the tuition.

When a student withdraws from a course, refunds are made on the following schedule:

Week 1	100%
Week 2	75%
Week 3	50%
Week 4	25%
Week 5	0%

NOTE: Kettering University Online (KUO) has their own Refund Schedule.

ACADEMICS POLICIES AND REGULATIONS

All faculty and students are urged to review and understand the University's Academic Policies and Regulations. This section is intended as a convenient reference for faculty, staff and students. It also serves as a description of the student's academic rights and responsibilities and as a guarantee of equitable treatment for all students. Some sections may reference other sections of the catalog, when necessary. Each section also concludes with the name of the official or office to contact with questions.

Academic Advising

Academic advising represents a shared relationship between the student and his/her academic advisor and a process of continuous improvement, clarification and evaluation with the aim of assisting the student in achieving his/her goals. Each academic department has established its own system for facilitating advising processes as well as a representative academic program. In addition to following the representative program, students are encouraged to communicate regularly with an academic advisor to discuss academic matters, to determine progress toward degree completion, and to ensure that prerequisites have been satisfied and other departmental requirements have been met.

Questions: Contact the degree/program department

Academic Standing Provisional Admission

Provisional Admission is a temporary admission status granted on a case-by-case basis that allows students to demonstrate their readiness for graduate work. A graduate student that has been granted provisional admission will be granted full admission after completion of their first two courses with a grade of 3.0 or better. Failure to complete the first two courses with a grade of 3.0 or better may result in dismissal from the program.

The criteria for provisional admission are uniquely determined by the departmental admissions committees, and in some cases collateral work may be required from the applicant to confirm their readiness for a specific program.

Probation

A graduate student whose cumulative grade point average falls below a 3.0 is automatically placed on academic probation. Probationary status is removed only when a graduate student's cumulative GPA equals or exceeds the minimum of 3.0 required to earn a Master's degree.

A graduate student who remains on probation after completing 12 credit hours since being placed on probation may be dismissed from the program. A probationary student whose cumulative GPA falls below 2.5 will automatically be dismissed from the graduate program. Such dismissals may be appeals to the Graduate Academic Review Committee. Advisement regarding the appeal process to return after academic dismissal is provided through the Graduate Office.

Separation

A student may be separated from the University if he/she fails to demonstrate progress toward the degree by successfully completing a class within any consecutive two year period.

Appeal Process to Return after Academic Dismissal

After academic dismissal through the Graduate Academic Review process, students may appeal to the Graduate Academic Review Committee for readmission by submitting a letter of appeal to the Graduate Academic Review Committee via the Graduate Office one term prior to the term in which they are seeking re-admittance.

This letter of appeal for re-admittance must state the cause(s) of the student's academic problems, changes in the student's situation that may rectify those problems and a proposed plan of action to ensure success in the Graduate Studies Program. Students are readmitted on a probationary status for one term.

Decisions of the Graduate Academic Review Committee are final.

Questions: Contact the Office of Graduate Programs

Active Status

Students are expected to enroll in their first class within a year of their acceptance term. Students that do not enroll within that year will have their enrollment status changed to "inactive". As a consequence, the student may need to reapply to the degree program.

Note: that students may also have their status changed to "inactive" if the program of study is suspended for more than two years. If inactivated, the student will need to contact the registrar's office to continue in the degree program.

Attendance

Last Known Date of Attendance Reporting:

Kettering University does not require faculty to take attendance. However, the U.S. Department of Education requires the Financial Aid Office to differentiate students who fail a class because they quit attending from those who fail a class based on merit. Because a student could be a financial aid applicant at any point during the academic year, we must collect this information for all students, so that financial aid eligibility can be accurately determined.

The Last Known Date of Attendance Reporting Policy is necessary to appropriately assess the financial liability for students, ensure good stewardship of financial aid funds, and limit the financial liability for the university and academic consequences for the student. The amount of Title IV funds earned by a student is based on the amount of time spent in attendance by the student for that term. In addition, this is often useful in arbitrating cases when students believe they completed the process to drop or withdraw from a course.

After the drop/add period each term, a 'last date of attendance' notification, or 'never attended' notification by a faculty member will result in the automatic assignment of either a WN (withdrawal for non-attendance) grade or an FN (failure for non-attendance) grade by the Registrar's Office. This will initiate re-evaluation of a student's financial aid and Federal Title IV aid will be adjusted for those classes.

Student Responsibility

Students are expected to regularly attend classes in which they are enrolled. Students who decide to stop attending courses should immediately withdraw from those course(s) prior to the course withdrawal deadline specified on the academic calendar. Students who do not officially withdraw from a course (or courses) they are not attending may be reported by their instructor as having a last date of attendance. When this happens, the student will remain responsible for any financial liability, less applicable refunds they have incurred associated with the last date of attendance reported, and for any academic consequences associated with the last date of attendance reported and the assignment of the WN or FN grade.

School Responsibility

After the drop/add period each term, a last date of attendance reporting by a faculty member will result in that automatic assignment of either a grade of WN (withdrawal for non-attendance) or FN (failure for non-attendance) by the Registrar's Office as follows:

- A grade of WN (withdrawal for non-attendance) will be issued if the last known date of attendance is within the course withdrawal period specified on the academic calendar. A WN grade is treated the same as a W (withdrawal) grade in that it will not affect a student's term or overall GPA.
- A grade of FN (failure for non-attendance) will be issued if the last known date of attendance is after the course withdrawal period specified on the academic calendar. An FN grade is treated the same as a failing grade in that it will be included in a student's term and overall GPA.
- Once a faculty member has reported a last date of attendance, the student will no longer be able to attend or participate in the class.

Auditing a Course

Occasionally, a student may wish to attend a course without earning credit (for example, to refresh course knowledge). This arrangement is called 'auditing' a course. Audited courses are listed on a transcript with the grade AU (audit) and no credits earned. Audited courses incur regular tuition fees; however, audits are not considered part of a course load for academic or financial aid purposes, which means that students cannot count audited credits toward a full-time student status, or receive financial aid for an audited class.

A student needs the course instructor's permission to audit a course. Students who want to audit a course must complete a Request to Audit Course Form (<https://my.kettering.edu/sites/default/files/resource-file-download/IARquestAudit.pdf>), have it signed by the course instructor, and submit it to the Office of the Registrar during the drop/add period specified on the academic calendar. Audits cannot be charged to a regular enrollment after the drop/add period noted on the academic calendar.

Students who choose an audit option are expected to attend the audited class and complete all course requirements (with the exclusion of the tests). If the students do not meet attendance requirements for the course, they earn the grade of WN (withdrawn for non-attendance). Once a WN grade is issued, the student may no longer attend or participate in the class. AU and WN grades do not affect the term and cumulative grade point averages.

Auditing of Online courses offered through Kettering University Online is not allowed.

Bachelor/Master Program

These options are available only to Kettering University undergraduate students entering the MBA, Operations Management, Engineering or Engineering Management graduate programs.

Kettering University undergraduate students who desire to obtain a master's degree may elect to complete the Bachelor/Master Program which provides students an opportunity to accelerate the process in which they earn both a bachelor's degree and a master's degree. This program is only available to Kettering University undergraduate students and leverages Kettering University's premier academic programs. Students who are admitted into the Bachelor/Master Program will complete the same total number of Co-op work terms as conventional non-Bachelor/Master undergraduate students.

Option 1: Undergraduate (BBA/BS) Thesis

- Students must apply before graduating (after completing 120 credit hours) or within six (6) years after obtaining their undergraduate degree.
- The student completes the undergraduate degree, with the traditional undergraduate thesis (BS), and received the bachelor's degree at the conventional time.
- Up to eight (8) credits of (500-level) courses known as mezzanine courses, which were completed at the undergraduate level, are also applied to the master's degree. (Mechanical Engineering capstone courses do not apply.)
- Forty (40) credits remain to complete the MBA (total of 48 graduate credits) or thirty-two (32) credits remain to complete the master of science degree (total of 40 graduate credits). As an option, four (4) of these credits can be granted for an MS thesis.

Option 2: Graduate Thesis Only: No Undergraduate Thesis

- Students must apply before starting their undergraduate thesis (i.e., before submitting their PTA).
- Eight (8) credits granted for the graduate-level thesis, four are applied to the undergraduate degree and four are applied to the graduate degree.
- The student will not receive the bachelor's degree until completion of the graduate-level thesis.
- Up to eight (8) credits of mezzanine level (500-level) courses, which were completed at the undergraduate level, are also applied to the master's degree.
- One course (four credits) will be waived in the graduate program.
- Twenty-eight (28) credits remain to complete the master's degree (a total of 36 graduate credits).
- The MS thesis will be a more purely academic thesis driven by the faculty, but must be authorized by the student sponsor.

Grade Requirements

A minimum GPA of 3.5 is required. Students with a GPA below 3.5 may be considered on an individual basis. The degree granting department will determine acceptance.

Other Requirements

- Both part-time and full-time MBA and MS students may qualify for this program.

- This program is only available to students who will receive (or have received) a Kettering University bachelor's degree.

Questions:

- For Mechanical Engineering options, please contact Dr. Raghu Echempati at 810-762-7835 or rechempa@kettering.edu
- For more information on this program for Business options, please contact the Department of Business at 810-762-7952 or business@kettering.edu.

Computer Requirements for Students

Kettering students are expected to have reliable access to high speed Internet outside of their workplace. The following minimum hardware requirements: a Pentium processor with 512 MB of RAM, a CD-ROM drive, a printer, a color monitor with appropriate graphics card, speaker(s) and appropriate sound card, and broadband internet connection for viewing streamed video. Software requirements include a word processing package, a spreadsheet package, a Microsoft PowerPoint viewer, Internet Explorer or Mozilla Firefox. Google Chrome is required for all KUO students. Students in some classes may be required to load software. Administrative computer access may be necessary.

It is expected that you have your own computer and do not use a computer at your place of employment due to frequent limitations related to Firewalls.

Concentrations

A concentration is a specialized area of study within a major area of study. Concentrations appear on a student's transcript at student declaration, and requirements must be completed at the time of graduation. A concentration is not required for all majors for graduation. A student wishing to declare a concentration must notify the Office of the Registrar to have it added to their record.

Question: Contact the Office of the Registrar

Curricula Restrictions

A student may elect no more than four (4) courses numbered below 600-level to count toward their Master's degree.

Questions: Contact the program advisor

E-mail: Notification/Obligation to Read

All students have the privilege of having a Kettering University Google Apps e-mail account. The Kettering e-mail account is one of the official ways Kettering University faculty and staff communicate to students. Students are responsible for required actions conveyed to them through this communication vehicle, **whether or not they read the message**.

Kettering provides each student with unlimited e-mail server storage. Therefore, we strongly recommend that students do not auto forward to another e-mail service provider which may have less storage capacity, fewer features, and may hinder you to reply directly to the original email source.

Due to the proliferation of spam and phishing emails, be advised that you may receive emails that may request personal information such as usernames and passwords. Although it may look authentic, pretending to originate from a legitimate source such as Kettering, do not respond. Immediately delete it recognizing that a legitimate source such as the Kettering IT department would never ask you to provide information such

as passwords. Be cautious regarding any unsolicited email as it may contain elements that would prove to be detrimental to your computer.

Questions: Contact Information Technology

Enrollment Status/Verifications

Enrollment Verifications (<https://my.kettering.edu/sites/default/files/resource-file-download/IAEnrollmentVerificationRequest.pdf>) may be obtained through the Office of the Registrar. Enrollment verifications confirm a student's enrollment status (full-time, half-time, less than half-time) and expected graduation date. Listed below are the graduate level enrollment statuses at Kettering University:

Enrollment Status

8 or more credits or THS1 or THS2 = Full Time
4-7 credits = Half Time
1-3 credits or THS3 = Less Than Half Time

Questions: Contact the Office of the Registrar

Grades

Course grades are available after each term via Banner Web. Federal law prohibits communication of grades by telephone. Students may access their grade report and/or print a grade report to provide to their company by logging on to Banner Web.

Grade	Description	Points
A	Outstanding	4.0
A-	Outstanding	3.7
B+	Satisfactory	3.3
B	Satisfactory	3.0
B-	Satisfactory	2.7
C+	Less than satisfactory	2.3
C	Less than satisfactory	2.0
C-	Less than satisfactory	1.7
F	Fail	0.0
AU	Audit	0.0
CR	Credit	0.0
FN	Failure for non-attendance	0.0
I	Incomplete	0.0
W	Withdrawal	0.0
WN	Withdrawn for non-attendance	0.0

Course Hours and Points Definitions

Quality Points = Grade x Credit Hours
GPA = Quality Points ÷ GPA Hours

Attempted hours (AHRS) – are the sum of the course credit hours for which a student has registered. Attempted hours per term is the basis for determining tuition charges and a measure of the student load.

Credit hour – represents one sixty-minute class period per week.

Earned hours (EHRS) – represent work equivalent to that defined for a University credit hour that the student has successfully completed at Kettering University, at another university or by examination. Not all earned hours necessarily apply to the specific degree program being pursued by the student.

Grade Point Average (GPA) – is computed for each term individually and cumulatively. In either case, the weighted GPA is computed by dividing the total quality points earned by the total quality hours accumulated.

GPA hours (GPA-HRS) – are equal to the credit hour value of the course and are awarded only for course work taken at Kettering University. Only course work resulting in GPA hours is used in computing a student's grade point average (GPA).

Quality Points (QPTS) – are a computational value used to compute a student's grade point average (GPA). The quality points earned for a given course are equal to the credit hour value of the course multiplied by the numerical equivalent of the letter grade.

Questions: Contact the Office of the Registrar

Grade Changes

Grades (except incompletes) reported by an instructor are considered permanent and final. However, requests for a change of grade after an instructor reports final grade will be honored to correct an error in calculating or assigning that grade. To facilitate this process, the instructor will submit to the Registrar a grade change form noting the rationale for the change and what retroactive correction is to be made. This form must be countersigned by the instructor's department head. Grade changes must be processed within one calendar year (12 months) from the last date of the term in which the course was taken. This includes incomplete grades that have been changed to a grade or have converted to a failing grade. Grade changes are not permitted after a degree has been awarded.

Graduation Requirements

Students must apply to graduate (<https://my.kettering.edu/content/graduate-application-graduate>) to begin the graduation process. The time-frame to submit this application is when registering for your last term of courses.

In order for a graduate degree to be awarded and verified by the Office of the Registrar, the following requirements must be satisfied:

- Successfully complete all prescribed courses within the six (6) year limit. A student who anticipates not meeting the time limit must notify the Graduate Office at least six (6) months prior to the expiration of the six (6) year limit.
- Achieve a final cumulative grade-point average (GPA) of 3.0 or higher.
- Successful completion of departmental outcome assessment activities. Students in the Department of Business (MBA, MSEM, MSOM degrees) are required to participate in the ETS Major Field Test at the conclusion of their studies. Contact the Department of Business for more information.

Financial Obligations

Diplomas and transcripts are withheld until the student has satisfied all financial obligations with the University.

Final Degree Verification Letter

A final letter is sent to the student when all requirements for graduation are met. Final letters will not be issued until all grades for the graduating term are submitted and posted to the student's record.

Degree Completion for Inactive Students with Coursework Remaining

Inactive students who wish to return to Kettering University must contact the Registrar's Office for assistance. After ensuring there are no outstanding financial obligations to the university, the Registrar will refer such students to the appropriate Academic Department Head or Discipline Chair to develop a plan of study. The final plan will be filed in the departmental office and in the student's permanent file in the Registrar's Office. These students will be subject to meeting the requirements for degrees in effect at the time of readmission.

Commencement

Commencement is the formal ceremony which recognizes and celebrates graduates and graduation candidates. At Kettering University, commencement is held annually at the conclusion of the spring term. Refer to the published academic calendar for the date of commencement. Detailed information (<https://www.kettering.edu/academics/academic-resources/office-registrar/graduation-information>) including eligibility requirements is available on the Office of the Registrar website.

Questions: Contact the Office of the Registrar

Incomplete Grades For On Campus Programs

The grade of 'I' (Incomplete) may be issued by an instructor for any course in which the instructor deems that the work has not been completed and that it would be fair and equitable to allow the student additional time to complete the work. The conditions and terms for completion of the course are mutually agreed upon by the instructor and the student. The deadline for completion is at the discretion of the instructor but is not to exceed six months from the last day of the term in which the course was registered. If a final grade is not submitted within six months, the incomplete grade converts to an 'F' (Fail) on the student's record and will be reflected in the students' GPA. The grade of 'F' will be considered a permanent grade.

The incomplete grade may be extended by the instructor for up to an additional six months, or one calendar year from the end of the term in which the course was registered. To initiate an extension, the instructor will notify the Office of the Registrar in writing. The instructor is under no obligation to grant an extension. If a final grade is not submitted within the six month extension period, the incomplete grade converts to an 'F' (Fail) on the student's record and will be reflected in the students' GPA. The grade of 'F' will be considered a permanent grade.

A written agreement must be developed between the instructor and the student to clarify a plan for completion of the course. The student initiates this agreement by completing an Incomplete Grade Agreement Form after the incomplete grade has been issued by the instructor. The form will be filed in the Office of the Registrar as official documentation of the agreement.

Students should note that an incomplete grade does not yet reflect credit in the course. This means if a course with an incomplete grade is a prerequisite for another course, they may not register for the other course until the incomplete grade has been changed to reflect a passing grade. Prerequisite overrides are granted at the discretion of the department head for the course.

Questions: Contact the Office of the Registrar

Independent/Directed Study

In order to increase the scope and flexibility of course offerings, many departments offer courses under the designation of Independent or Directed Study. A student who desires a course not normally offered or not available during a given term should approach the instructor in whose discipline the course would normally fall to discuss the possibility of an Independent or Directed Study. If the instructor agrees, a written proposal may be required from the student, specifying the reading and/or research to be undertaken, reports or rests to be used for grading purposes, number of meetings per week, number of credits to be awarded, etc.

Independent Study

An independent study is a unique topic in a specific area of study not offered in an existing course. Requirements and meeting times are arranged by the instructor and student. A student must request and receive approval for an independent study through the instructional department. This is done by completing an Independent/Directed Study Form stating the independent study name and description, and obtaining all required signatures. The completed form must be submitted to the Office of the Registrar no later than the last day of the drop/add period specified on the published academic calendar.

Directed Study

A directed study is a course listed in the catalog but not scheduled during a given term. It is done on a one-on-one basis with an instructor for that course. A student must request and receive approval for a directed study through the instructional department. This is done by completing an Independent/Directed Study Form stating the course number and obtaining all required signatures. The completed form must be submitted to the Office of the Registrar no later than the last day of the drop/add period specified on the published academic calendar.

Questions: Contact the department offering the course

Readmission to Kettering University

Student who were academically eligible to continue when they became inactive or withdrew may request readmission by contacting the Office of the Registrar.

Questions: Contact the Office of the Registrar

Registration

Registration is the process by which a student enrolls in a specific course(s) during a specific term. Registration for courses occurs after the application/admission process is complete and the student has been granted admission. Students cannot receive credit for a course for which they have not registered. Students must register for courses every term they wish to take classes.

Course Selection

Selection of courses is each student's own responsibility. The student is personally responsible for being aware of prerequisite coursework and choosing program courses accordingly. To assist with your planning, program curricula is available online or in this catalog for each Kettering graduate program. Since many of our degree programs are designed for people who have full-time jobs, a normal term course load is one or two courses. Kettering University advises against heavier loads except for resident students who are not employed. The responsibility for deciding how many courses to take in a term is solely the student's.

Registration: On Campus Graduate Students

Students must register online via Banner Web. Registration instructions can be found on the Office of the Registrar website.

Students who register for classes via the web will receive an email notification to their Kettering email with instructions on how to log into Banner Web to retrieve their official billing invoice/statement the week following the close of the web registration period. This billing statement will confirm enrollment and denote the required tuition. Payment may be made by check, money order, employer voucher, or through FACTS (e-Cashier), our third-party service provider.

Undergraduates Taking Graduate Courses

Only Kettering's undergraduate students are eligible to take graduate courses at Kettering while still an undergrad. Please refer to the Undergraduate Programs catalog, in the 'Registration' section for more information.

Questions: Contact the Office of the Registrar

Repeating a Course

A student who receives a failing grade must retake the course if it is required for their program. Both grades will appear on the transcript but only the second grade is used in the computation of the cumulative grade point average. A student may repeat a course only once to improve his/her cumulative grade point average.

Courses taken for undergraduate credit at Kettering University may not be repeated at the graduate level and count towards the graduate program. Furthermore, 500-level courses taken at Kettering University for undergraduate credit may not count as graduate credit except as approved per the Bachelor/Master policy guidelines.

Questions: Contact the Office of the Registrar

Student Complaint Procedures

A complaint is a written or verbal expression of dissatisfaction or formal allegation against the university, its units, its employees (including faculty and staff), and/or its students.

Harassment and Discrimination

For complaints related to harassment or discrimination in the learning or work environment, refer to the Student Life section of the undergraduate catalog, under Student Conduct: Behavioral Standards.

Other Complaints

Currently enrolled students who have a complaint or issue should first try to work out the problem informally by discussing it in an honest and constructive manner with those persons most involved with the issue. Many complaints can be resolved when a student makes an effort to honestly communicate his/her frustrations or concerns. If a student has a complaint related to a specific course he or she is enrolled in, he/she should first consult with the instructor of the course. If necessary, the student or instructor may consult with the academic department head responsible for the course for guidance on how to best resolve the student's concern.

For any complaints that the student cannot resolve informally with the parties involved, the student should contact either the Dean of Student (for non-academic-related issues) or the Associate Provost for Academic Support (for academic-related issues).

Student Conduct

Academic Misconduct

The mission of Kettering University rests on the premise of intellectual honesty, whether on-campus or off-campus through distance learning. Graduate students are expected to perform ethically under all circumstances. It is the policy of Kettering University to foster the qualities of fairness, openness, and intellectual honesty, and to discourage and punish dishonest behavior in any form.

Academic Terms

The Kettering University campus operates on four 11-week terms per year.

Thesis

Thesis Option – MS in Engineering

A thesis option is available for designated graduate programs. The thesis replaces one or two courses run 6 weeks although several which are specified by the degree department. The thesis is required for on-campus mechanical engineering research assistants.

Master's Thesis

Students must be participants in classes on campus during at least two of the terms in which they are working on the thesis. The degree department will specify which course(s) will be replaced by the thesis. Criteria for topic selection are up to the degree department, as are thesis-option prerequisites, if appropriate. Information about the administrative requirements for a Master's Thesis may be obtained from the Graduate Office.

A thesis committee of at least three (3) faculty members is required. Students must obtain the written consent of the individuals who will serve on the committee, starting with the professor who will be the major advisor and chair of the committee. If a student is unable to find a professor to be the major advisor, then the student will not be able to elect the thesis option. Students are urged to form the advisory committee and gain approval of a written research proposal during their first year of graduate student and should begin work on the thesis project as soon as the proposal is approved. Registration for thesis credits requires the approval of the chair of the thesis committee. This approval is contingent upon prior approval of the research proposal by the thesis committee.

Master's theses are theory-based and goal-oriented. The criteria for success are achievement of the research goal and production of a written thesis of publishable quality. Questions: Contact the program advisor

Transfer Credit

The maximum number of graduate credits for which a person may receive transfer credit is eight (8) credit hours. Credit is considered for transfer for classes with grades of B or better. All requests for transfer credit should be for graduate-level courses (taken for graduate credit) significantly similar to a specific course within the student's program.

To apply for transfer credit, the student must complete an Application for Transfer Credit Form (https://my.kettering.edu/sites/default/files/resource-file-download/IA_MS_TransferCreditRequest_Instructions_1.pdf) and furnish an official transcript from an accredited institution, plus a course description and syllabus. There is a processing fee of \$5.00 (U.S.) per credit hour for

transfer credit (i.e., the processing fee to transfer a 4-credit course is \$20.00).

Note: Programs through the Department of Business have additional transfer credit guidelines. Refer to the individual program sections of this catalog for more information.

Questions: Contact the Graduate Office at gradoff@kettering.edu for more information.

Withdrawals

Course Withdrawals

When circumstances occur whereby a student feels that completion of a course is not possible or in the student's best interest, the student may request a non-punitive grade of W (Withdrawn) be issued by the Registrar's Office. Such requests will be accepted and honored during the course withdrawal period specified on the published academic calendar. After the course withdrawal period, the student may not withdraw from the course and is committed to receiving a Kettering University letter grade. A student who wishes to withdraw from a course must submit a written request using the Graduate Program Course Withdrawal Form (<https://my.kettering.edu/sites/default/files/resource-file-download/IAGradCourseWithdrawalForm.pdf>). Refunds or reduction of tuition are made according to the published schedule in the graduate catalog.

University Withdrawal

Withdrawing from the University requires a written request to the Office of the Registrar at registrar@kettering.edu.

Withdrawal due to Active Duty

Students may withdraw from the University and receive a 100% tuition refund upon presenting to the Registrar, the original Armed Forces orders. Non-punitive grades of W will be issued. Should the call come during eighth week or later, in the judgment of the instructor and the student, incompletes may be given with no reimbursement of tuition. Course work then would be completed per arrangements agreed upon by the instructor and student.

Questions: Contact the Office of the Registrar

On-Campus Plan of Study for International students

International students will be able to utilize a summer term for internships, better aligning the graduate program with the University's mission. The on-campus programs operate on a calendar similar to a conventional quarter system: Fall, Winter, and Spring terms are "regular" academic terms during which students normally enroll full-time, and the Summer term is optional.

Many variations of this plan are possible, both with or without thesis. In particular, students may begin the program in any term, not just Fall. However, international students are required to complete two academic terms to be eligible for a non-study/internship term. This works perfectly for students that start in Fall or Winter. If an international student starts in Spring term, they will not be able to take an internship their first summer. They may forego the non-study/internship term or apply to have their non-study/internship term changed to a regular academic term. For an international student, only one non-study/internship term is allowed during the plan of study.

The non-study/internship term offers the opportunity for the student to work in an internship at a related industry, work on-campus, travel, or optionally register in further coursework.

Please refer to specific program information as you develop your plan of study. Note that the EE and CE concentrations in the Master of Science program mandate the master's thesis and it is non-credit bearing. However in the other engineering concentrations the master's thesis is optional and carries 4 credit hours.

Also note that 8 credit hours is considered a full time load for financial aid, and for visa requirements. Some students are successful at carrying a higher load. Other students find that taking only one class at a time works best for them unless it creates an issue with financial aid or visa issue.

Students enrolling in the on-campus MS in Operations Management, MS in Engineering Management, and the MBA may have additional prerequisite courses to complete that will further lengthen the plan of study.

Example Plan of Study without Thesis:

Classification	Code	Earned Hours
First Year	Fall	8 credits coursework
	Winter	8 credits coursework
	Spring	8 credits coursework
	Summer	Non-Study / Internship term
Second Year	Fall	8 credits coursework
	Winter	8 credits coursework

Example Plan of Study with Thesis:

Classification	Code	Earned Hours
First Year	Fall	8 credits coursework
	Winter	8 credits coursework
	Spring	8 credits coursework
	Summer	Non-Study / Internship term
Second Year	Fall	8 credits coursework
	Winter	8 credits coursework + thesis 1
	Spring	Thesis defense and submission

Example Plan of Study without Thesis, taking summer classes.

Classification	Code	Earned Hours
First Year	Fall	8 credits coursework
	Winter	8 credits coursework
	Spring	8 credits coursework
	Summer	8 credits coursework
Second Year	Fall	8 credits coursework

Student Records

The Office of the Registrar maintains the students' permanent academic record, including course registrations, enrollment status and the official transcript. The Registrar's Office is the point of contact for any required enrollment and degree certifications. As such, it is important that

students keep the office current with their permanent mailing address so these services can be provided.

Note: The Registrar's Office will not discuss the student record with any third party without a written consent from the student.

Address, Phone, and Name Changes

Changes in addresses or phone numbers should be made by the student through Banner Web (https://jweb.kettering.edu/cku1/twbkwbis.P_GenMenu?name=homepage) Self Service. Changes in addresses and phone numbers can also be made in the Registrar's Office, Room 3-309 AB.

In order to process a name change, a copy of a government issues photo ID such as a driver's license and either a marriage license, a Social Security card, or a court order that reflects the new name are necessary. Name changes must be processed through the Registrar's Office.

Permanent Academic Records

All information, applications, correspondence, etc., involved in admitting and processing the active progress of an admitted student are maintained for five years after the student has last been an active degree-seeking student. After five years, only the student's attendance dates, academic performance, corporate affiliate, and degree awarded are kept as a permanent record.

Transcripts

A student's official academic record is your transcript and is maintained by the Registrar's Office at Kettering University and is normally reflected through a transcript. All requests for transcripts (<https://www.kettering.edu/academics/academic-resources/office-registrar/transcripts-enrollment-verification/transcript-reqe-0>) must be in writing and should include the student's full name (or name used while attending Kettering), Student Identification Number (or last four digits of Social Security number), current daytime telephone number and signature to ensure proper identification of the records requested. The Registrar's Office will accept this written permission in person, by face 810-762-9836, scan/email, or by US mail. There is no charge for transcripts. Official transcripts will not be issued to students who fail to meet their financial obligations or agreements with Kettering University. Unofficial transcripts are also available on Banner Web (https://jweb.kettering.edu/cku1/twbkwbis.P_GenMenu?name=homepage).

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act (commonly referred to as "FERPA" or the "Buckley Amendment"), helps protect the privacy of student records. The Act provides for the right to inspect and review education records, the right to seek to amend those records and to limit disclosure of information from the records. The Act applies to all institutions that are the recipients of federal funding.

In accordance with FERPA, Kettering University has policies and procedures in place to protect the privacy of education records. Students will be notified of their FERPA rights annually by publication in the Undergraduate and Graduate Catalogs and by an annual email message to students at the beginning of the academic year.

Disclosure of Education Records

Kettering University will disclose information from a student's education record only with the written consent of the student, except:

1. To school officials who have a legitimate educational interest in the records.

A school official is:

- A person employed by the university in an administrative, supervisory, academic, research, or support staff position (including Campus Safety and Wellness Center staff);
- A person elected to the Board of Trustees;
- A student serving on an official committee, such as disciplinary or grievance committee, or assisting another school official in performing his or her task;
- A volunteer or person employed by or under contract to the university to perform a special task, such as legal counsel or an auditor;
- Agencies conducting business on behalf of Kettering University (i.e. National Student Clearinghouse, officials of the U.S. Department of Education and state and local educational authorities, accrediting organizations and banks).

Educational Need to Know:

A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibilities for Kettering University.

2. To officials of another school, upon request, in which a student seeks or intends to enroll.
3. In connection with a student's request for or receipt of financial aid, as necessary to determine the eligibility, amount, or conditions of the financial aid, or to enforce the terms and conditions of the aid.
4. To organizations conducting certain studies for or on behalf of the university.
5. To comply with a judicial order or a lawfully issued subpoena.
6. To appropriate parties in a health or safety emergency.
7. When the request is for directory information (see below).

Directory Information

Institutions may disclose information on a student without violating FERPA through what is known as "directory information." Kettering University designates the following categories of student information as public or "Directory Information." Such information may be disclosed by the institution at its discretion.

- Corporate affiliation
- Degrees awarded, including dates (actual and expected)
- Dates of attendance
- Degree program (major field of study, concentrations and minors)
- Degrees and honors awarded (including Dean's List)
- Enrollment Status (including full or part-time)
- Honor Societies
- Photo
- Previous institutions attended
- Class standing (freshman, sophomore, junior, senior, graduate student)
- Name, address and phone number
- E-mail address

Solomon Amendment

Federal law requires that all institutions of higher learning provide directory information to the military upon request, including student name, address, telephone number, age or year of birth, academic major and level of education (e.g. freshman, sophomore, etc. or degree awarded). Where there is a conflict between the Family Educational Rights and Privacy Act of 1974 (FERPA), the Solomon Amendment would supersede FERPA.

Annual Notification to Students of Rights Under the Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act (FERPA) affords students certain rights with respect to their education records. They include:

1. Inspect and Review of Records

The right to inspect and review the student's education records within 45 days after the day the University receives a request for access. A student should submit to the registrar, dean, head of the academic department, or other appropriate official, a written request that identifies the record(s) the student wishes to inspect. The University official will make arrangements for access and notify the student of the time and place where the records may be inspected. If the records are not maintained by the University official to whom the request was submitted, that official shall advise the student of the correct official to whom the request should be addressed.

2. Amendment of Records

The right to request the amendment of the student's education records that the student believes are inaccurate, misleading, or otherwise violate the student's privacy rights under FERPA. Students should write the University official responsible for the record, clearly identify the part of the record they want changed, and specify why it should be changed. If the University decides not to amend the record as requested, the University will notify the student of the decision and advise the student of his or her right to a hearing regarding the request for amendment. Additional information regarding the hearing procedures will be provided to the student when notified of the right to a hearing.

3. Consent to Disclosure

The right to provide written consent before the university discloses personally identifiable information from the student's education records, except to the extent that FERPA authorizes disclosure without consent.

The school discloses education records without a student's prior written consent under the FERPA exception for disclosure to school officials with legitimate educational interests. A school official is a person employed by Kettering University in an administrative, supervisory, academic, research, or support staff position (including Campus Safety and Wellness Center staff); a person serving on the board of trustees; a student serving on an official committee, such as a disciplinary or grievance committee, or assisting another school official in performing his or her task; a volunteer or person employed by or under contract to the university to perform a special task, such as legal counsel or an auditor; agencies conducting business on behalf of Kettering University (i.e. National Student Clearinghouse, accrediting organizations and banks).

A school official has a legitimate educational interest if the official needs to review an education record in order to fulfill his or her professional responsibilities for Kettering University.

4. FERPA Complaints

The right to file a complaint with the U.S. Department of Education concerning alleged failures by Kettering University to comply with the requirements of FERPA. The name and address of the Office that administers FERPA is:

Family Policy Compliance Office
U.S. Department of Education
400 Maryland Avenue, SW.
Washington, DC, 20202

For more information on the Family Educational Rights and Privacy Act, visit the Office of the Registrar Website, under FERPA (<http://www.kettering.edu/academics/academic-resources/office-registrar/family-educational-rights-and-privacy-act-ferpa>).

INFORMATION TECHNOLOGY

Information Technology Services (ITS) Operations is located in the Academic Building (AB), Room 2-340. All students have the privilege of using Kettering technology resources as long as they abide by the Acceptable Use of Information Technology Resources Policy, the Information Resources Policies, Etiquette & Rules and any other IT policies as documented. These documents are available on the Information Technology Services website located on www.kettering.edu/it (<http://www.kettering.edu/it>). Some of the major technical services provided to students are:

Help Desk – The Help Desk is located in the Academic Building (AB), Room 2-340. The Help Desk is available for technical support of our computing resources. The Help Desk is open 8:00 a.m. – 5:00 p.m., Monday through Friday, and may be contacted by phone at 810-237-8324 or by coming in person to 2-340 AB. You may also send e-mail to helpdesk@kettering.edu at any time. The support staff will respond to support requests during normal business hours.

E-mail – All students have the privilege of having a Kettering University Google Apps e-mail account. The Kettering e-mail account is the official way Kettering University faculty and staff communicate to students. Students are responsible for required actions conveyed to them through this communication vehicle, **whether or not they read the message**. Kettering provides each student with unlimited e-mail server storage. Our policy is to communicate via Kettering email, to ensure FERPA compliance. Therefore, please do not auto forward to another e-mail service provider which may have less storage capacity, fewer features, and may hinder you to reply directly to the original email source.

Due to the proliferation of spam and phishing emails, be advised that you may receive emails that may request personal information such as usernames and passwords. Although it may look authentic, pretending to originate from a legitimate source such as Kettering, do not respond. Immediately delete it recognizing that a legitimate source such as the Kettering IT department would never ask you to provide information such as passwords. Be cautious regarding any unsolicited email as it may contain elements that would prove to be detrimental to your computer.

Virus Protection – We strongly recommend that all students install virus protection software and maintain it to protect their personal PCs. Any up to date properly licensed or free virus protection software would be acceptable.

It is mandatory to have virus protection installed, current, and running when connected to the Kettering network.

Internet Access – Internet access is available through Kettering University network for business and academic purposes. Faculty, staff, and students will also have access to the Internet, as well as most network resources, using their wireless devices. Students are required to use the KUSTUDENT wireless SSID for encrypted high speed access.

Web-Based Student Services – All students have access to a variety of on-line services through their web browser. They can view academic information such as grades, class schedules, and transcripts, as well as information about their financial account. They can also have access to view and update address, telephone numbers, and email addresses to facilitate communication with Kettering University faculty and staff.

Blackboard – Many professors utilize the Blackboard Learning Management System for course syllabi, homework assignments, and

tests. Access to Blackboard is available from anywhere a student has an internet connection. To help protect your privacy, security, and confidential information, you must sign-on to Blackboard to access these services. blackboard.kettering.edu (<https://blackboard.kettering.edu>)

KUCloud – KUCloud is Kettering University's virtual desktop environment. KUCloud has a range of software available for students to use free of charge. kucloud.kettering.edu (<https://kucloud.kettering.edu>)

Computer Labs – The main computer labs are located in the computer wing on the 3rd floor of the Academic Building. There are computers running Windows and Linux available for student use. Students have 12GB storage on the network. Most of these are available 24 hours a day, 7 days a week unless otherwise posted. There are also various departmental labs that are regulated by the host academic department.

Information and Help Sheets – Help for accessing the various systems, including the Internet, is available in the IT Department Help Desk, (2-336 AB) and on the IT website (<https://my.kettering.edu/offices-administration/information-technology>). The IT web pages contain valuable information to help maximize your use of the Kettering University computing resources.

LIBRARY SERVICES

Kettering University Library

Located on the second floor of the Academic Building, the Library (<https://my.kettering.edu/academics/academic-resources/library>) has a collection of over 196,231 items of print and non-print materials, with 44,181 periodical titles. The Library Mission focuses on service. "In support of Kettering University's mission, goals, and curriculum, the library and archives serve the university community by providing resources and services to facilitate quality teaching, learning, and research."

Library Catalog

Kettering University Library is a member of PALnet, an academic resource sharing library network. Searches in the library catalog can be expanded to reveal the holdings of Kettering University Library and cooperative members, Mott Community College and Baker College. For more information, or for assistance using the catalog, call 810-762-9598, or email: library@kettering.edu.

Collection

Materials purchased for the library collection are to support the curriculum of Kettering University. Leisure reading material, fiction, newspapers, magazines, eBooks, and video games are also available. Special attention has been given to include the publications of American Society of Mechanical Engineers (ASME), Institute of Electrical and Electronics Engineers (IEEE), Society of Automotive Engineers (SAE), Society of Manufacturing Engineers (SME), American Chemical Society (ACS), Association of Computing Machinery (ACM), American Mathematical Society (AMS), and proceedings for many curriculum-related societies. Access and storage for student theses is another important part of the collection.

Hours/Loan Information

The library is open seven days a week, with reference assistance available most of those hours. During final exam week, the library hours are extended. Changes in hours are posted on the sign just outside the library entrance and on the webpage (<https://my.kettering.edu/academics/academic-resources/library>). A drop box is located near the library entrance for item returns when the library is closed.

Some helpful library telephone numbers include:

Phone Number	Contact
810-762-7814	Circulation Desk
810-762-9841	Interlibrary Loan
810-762-9598	Reference Desk
800-955-4464	Kettering University Toll-free Number

While the library is open to the public for use during all of its hours of operation, circulation of library material is restricted to Kettering University students, faculty, staff, alumni, corporate sponsor employers, donors to the Friends of the Library and Archives (FOLA) members. Students, faculty and staff may renew material twice, by phone, online, or in person. The standard loan period for Kettering University Library materials is 30 days. Course reserves (e-Reserves) are available on Blackboard. Photo ID cards serve as library cards and must be presented when checking out materials. The library has 16 computer work stations

and wireless connectivity (WiFi). Two Xerox multi-function devices (MFDs) provide copying, printing, and email scanning in both black and white and color. The MFDs also have the ability to scan to and print from USB storage devices and send/receive faxes. There are several new tablets and e-readers, a Karma mobile hotspot, a TI-84 graphing calculator, and a laptop available for checkout. A 27" Apple Macintosh computer is available for student audio and video projects and is preloaded with Adobe Creative Suite, including Photoshop, Illustrator, and Flash. There is a charging station which can charge almost any phone or mobile device.

Interlibrary Loan

Materials not owned by the Kettering University Library can usually be obtained through Interlibrary Loan (ILL). Resource sharing is available to students, faculty and staff. In addition to local reciprocal agreements, the library uses a world-wide database of library holdings to locate requested material. Interlibrary Loan is not a free service, but most requests are filled free of charge. The library absorbs many of the costs which can include lender fees, postage, and copyright permissions. In cases where the total per item charge exceeds \$50, the requesting party will be asked to pay any amount exceeding the \$50 limit. ILL staff will seek approval before proceeding with the request. For our students, faculty and staff, other reciprocal agreements are available among the Flint-area academic libraries. Please contact a Librarian or ILL Technician for assistance with your request.

Database Access

The Library subscribes to various multi-disciplinary databases that house academic journals, newspaper and magazine articles, technical papers, conference proceedings and standards. Access is available 24/7 for all students, both on campus and off. Popular society subscriptions include the Association for Computing Machinery (ACM), American Society of Mechanical Engineers (ASME), and the Institute of Electrical and Electronics Engineers (IEEE).

Instruction

Equipment or database assistance is available on an individual basis. Exposure to general and specialized library resources is also provided through instructor-requested tours and classroom presentations.

Kettering University Archives

The University Archives is located on the main floor of the Campus Center. The archives document America's industrial and business heritage with particular interest in the American automobile industry, the city of Flint, and the history of Kettering University. The Charles Kettering Collection is one of the largest collections in the archives and has been used by scholars worldwide. The archives' digital photo collection now exceeds 100,000 images. A collection of 375,000 vehicle patents are also found in the archives. A partial online catalog along with digitized photos can be found on the archives website (<https://my.kettering.edu/about/our-history-archives>). The archives can be contacted at 810-762-9661.

ALUMNI ENGAGEMENT

The Office of Alumni Engagement (<https://www.kettering.edu/alumni>) connects and engages Kettering University alumni through gatherings and events with the end result being a dynamic relationship between the University and Alumni who will be more engaged and involved in volunteering, mentoring, recruiting, and giving back to the University.

By partnering with the Kettering/GMI Alumni Association Board, Admissions, Marketing, Co-op, Annual Giving, and all University Advancement, the Office of Alumni Engagement will incrementally increase each year the number of alumni engaged and giving back to the University through well-timed and meaningful programs and activities.

Each year, programming includes class reunions, Homecoming Weekend, regional alumni receptions throughout the country, company alumni "Bulldog Breakfasts," alumni recognition ceremonies, and affinity programs directed to specific alumni. Other types of programming include the Alumni Ambassador program and working to establish Alumni Regional Networks in geo-targeted areas.

The Kettering/GMI Alumni Association Board is made up of alumni who want to give back to the University with their time, talent, and resources. The Board is comprised of five committees:

1. Student Recruitment/Alumni Involvement
2. Alumni Events
3. Alumni Awards
4. Alumni Service and Benefits
5. Directorship

The Kettering/GMI Alumni Association annually recognizes outstanding and notable alumni for their professional accomplishments with the following awards:

1. Alumni Service Award
2. Young Alumni Award
3. Engineering Achievement Award
4. Entrepreneurial Achievement Award
5. Management Achievement Award
6. Civic Achievement Award
7. Outstanding Achievement Award
8. Human Relations Award
9. Distinguished Alumnus/Alumna Award

The Alumni Engagement staff and Alumni Board jointly support the Student Alumni Council (SAC) on campus. SAC is a 15-student organization fostering interaction between alumni and students through various activities such as the Visiting Alumnus/Alumna Speaker Program, fundraising, Homecoming Weekend, and special workshops. SAC typically brings four alumni speakers on campus each term representing a diversity of industries, careers, and subjects students are interested in.

BOARD OF TRUSTEES

Board Leadership

Mr. Jeffrey J. Owens, *Chairman*

CTO and Executive Vice President, Delphi Automotive, Troy, MI

Dr. Robert K. McMahan, Jr., *President*

President, Kettering University, Flint MI

Ms. Diana D. Tremblay '82, *Vice Chairman*

Vice President, Global Business Services, General Motors Company, Detroit, MI

Dr. Jane E. Boon '90, *Secretary*

New York, NY

Mr. Henio R. Arcangeli, Jr. '86

Manhattan Beach, CA

Ms. Lizabeth A. Ardisana

CEO, ASG Renaissance, Dearborn MI

Ms. Carla J. Bailo '83

AVP Mobility Research and Business Development, The Ohio State University, Columbus, OH

Mr. Walter G. Borst '85

EVP and CFO, Navistar International Corporation, Lisle, IL

Dr. Donald B. Chaffin '61

R.G. Snyder Distinguished University Professor (Emeritus), Industrial & Operations Engineering & Biomed Engineering, University of Michigan, Ann Arbor, MI

Mr. Bruce D. Coventry '75

Chairman, TowerSec Inc., Ann Arbor, MI

Dr. Gary L. Cowger '70

Chairman and CEO, GLC Ventures, LLC, *Retired* Group Vice President, Global Manufacturing & Labor, General Motors Corporation, Bloomfield Hills, MI

Mr. Cornelius (Neil) De Koker '67

Founder, President and CEO (retired), Original Equipment Suppliers Assn, Bingham Farms, MI

Ms. Jacqueline A. Dedo '84

Wolverine Lake, MI

Mr. Gregory S. Deveson '84

Senior Vice President, Driveline & Chassis Controls Systems, Magna Powertrain USA Inc, Troy, MI

Mr. Phillip C. Dutcher '74

COO, NCH Healthcare System, Naples, FL

Mr. David S. Hoyte '71

President, Transformation Management LLC, Executive in Residence, Huizenga School of Business, Nova Southeastern University, Fort Lauderdale, FL

Mr. Charles F. Kettering III

President, Ridgeleigh Mgmt. Company, Cherry Hills Village, CO

Mr. Jesse M. Lopez

CEO, BAE Industries, A Marisa Company, Auburn Hills, MI

Mr. Michael Mansuetti

President, Robert Bosch LLC, Farmington Hills, MI

Mr. John W. Moyer

President, Asahi Kasei Plastics, Fowlerville, MI

Mr. Raj Nair '87

Executive Vice President & Chief Technical Officer, Global Product Development, Ford Motor Company, Dearborn, MI

Ms. Cynthia A. Niekamp

Senior Vice President, Automotive Coatings, PPG Industries Inc, Troy, MI

Mr. Paul S. Peabody

Vice President and CIO, Bronson Healthcare Group, Kalamazoo, MI

Mr. Raymond E. Scott

Executive Vice President and President, Seating Operations, Lear Corporation, Southfield, MI

Ms. Marjorie Sorge

Executive Director, Detroit Regional News Hub, Livonia, MI

Ms. Lyn St. James

Lyn St James Enterprises LLC, Phoenix, AZ

Mr. Randy Stashick

Vice President, Engineering, UPS, Atlanta, GA

Mr. Norman J. Szydlowski '74

Tulsa, OK

ADMINISTRATION AND FACULTY

Senior Administration

Dr. Robert K. McMahan, Jr., President

Dr. James Z. Zhang, Senior Vice President for Academic Affairs and Provost

Mr. Thomas W. Ayers, Vice President for Administration and Finance

Mr. Cornelius (Kip) Darcy, Vice President for Marketing, Communications and Enrollment

Ms. Susan L. Davies, Vice President for University Advancement and External Relations

Ms. J. Betsy Homsher, Vice President for Student Life and Dean of Students

Ms. Viola M. Sprague, Vice President for Instructional, Administrative and Information Technology

Dr. Christine M. Wallace, Vice President for Kettering Global

Mr. Donald G. Rockwell, University Counsel

Academic Department Heads

Ms. Karen Cayo, Department of Business (Interim)

Dr. Srinivas Chakravarthy, Department of Industrial & Manufacturing Engineering

Dr. Leszek Gawarecki, Department of Mathematics

Dr. John Geske, Department of Computer Science, including Bioinformatics

Dr. Craig J. Hoff, Department of Mechanical Engineering

Dr. Karen Palmer, Department of Electrical & Computer Engineering (Interim)

Dr. Stacy Seeley, Department of Chemistry & Biochemistry, including Chemical Engineering and Applied Biology

Dr. Kathryn Svinarich, Department of Physics, including Engineering Physics

Dr. Karen Wilkinson, Department of Liberal Studies

Faculty

The Kettering University faculty listed below have been designated to teach the graduate courses for our programs. The majority hold doctorates and nearly all of them have consulting experience in industry and business.

Basem Alzahabi, Professor of Mechanical Engineering
B.S. 1981, Damascus University, Syria; M.S. 1986, M.S. 1988, Ph.D. 1995, University of Michigan

Patrick J. Atkinson, Professor of Mechanical Engineering
B.S. 1991, Kettering University; M.S. 1994, Ph.D. 1998, Michigan State University

K. Joel Berry, Professor of Mechanical Engineering
B.S.M.E. 1979, General Motors Institute; M.S. 1981, Michigan State University; Ph.D. 1986, Carnegie Mellon University; P.E., Michigan

Karen E. Cayo, Interim Department Head, Business & Lecturer, Marketing
B.B.A. 1979, M.A. 1980, Western Michigan University

Srinivas R. Chakravarthy, Department Head & Professor of Industrial Engineering

B.Sc. 1973, M.Sc. 1975, University of Madras, India; Ph.D. 1983, University of Delaware

Gregory W. Davis, Professor of Mechanical Engineering
B.S. 1982, University of Michigan; M.S. 1986, Oakland University; Ph.D. 1991, University of Michigan

Raghu Echempati, Professor of Mechanical Engineering
B.S.M.E. 1970, Andhra University, Waltair, India; M.Tech. 1972 & Ph.D. 1976 Indian Institute of Technology, P.E., Mississippi

Mohamed E. M. El-Sayed, Professor of Mechanical Engineering
B.S.M.E. 1975, M.S.M.E. 1979, Alexandria University, Egypt; M.S.M.E. 1981, Ph.D. 1983, Wayne State University

John G. Geske, Department Head & Associate Professor of Computer Science
B.S. 1974, M.S. 1979, Ph.D. 1987, Iowa State University

James E. Gover, Professor of Electrical Engineering
B.S. 1963, University of Kentucky; M.S. 1965; Ph.D. 1971, University of New Mexico

Rajiv Gupta, Adjunct
Ph.D. Industrial Engineering, Purdue University

Huseyin R. Hiziroglu, Professor of Electrical Engineering
B.S. 1975, Gazi University, Ankara, Turkey; M.S. 1979, Middle East Technical University, Turkey; Ph.D. 1982, Wayne State University

Craig J. Hoff, Department Head, Mechanical Engineering, Professor of Mechanical Engineering
B.S. 1979, Michigan State University; M.S. 1981, Michigan State University; Ph.D. 1992, University of Michigan, P.E., Michigan

Petros Ioannatos, Associate Professor of Economics
B.A. 1979, The Athens Graduate School of Economics and Business Science, Greece; M.A. 1982, University of Windsor, Canada; Ph.D. 1989, Wayne State University

Norman Irish, Visiting Professor of Business
B.A. 1969, Olivet College; M.A. 1972, Eastern Michigan University; Ph.D. 1984, Wayne State University

Beverly Jones, Associate Professor of Management
A.S. 1987, B.Sc. 1987, Northwood Institute; M.S. 1990, Central Michigan; Ph.D. 1994, Union Institute

Kenneth L. Kaiser, Professor of Electrical Engineering
B.S. 1983, M.S. 1984, Ph.D. 1989, Purdue University, P.E. Michigan

Venu Lakshmanan, Adjunct
B.S. 1983, Metallurgical Engineering, Indian Institute of Technology; M.S. 1984, Mechanical and Aerospace Sciences, University of Rochester; Ph.D. 1990, Materials Science & Engineering, University of Rochester

Cherng-Tarn (Tony) Lin, Professor of Industrial Engineering
B.S. 1972, Tamkang University, Taiwan; M.S. 1976, Villanova University; Ph.D. 1983, Iowa State University

Terri M. Lynch-Caris, Associate Professor of Industrial Engineering
BSIE 1988, Kettering University; MSIE 1990, Purdue University; Ph.D. 2000, University of Michigan

Neil T. McCarthy, Associate Professor of Finance

B.M.E. 1965, General Motors Institute; M.B.A. 1967, University of Miami;
M.S. 1971, Ph.D. 1977, Rensselaer Polytechnic Institute

Arnaldo Mazzei, Professor of Mechanical Engineering
B.S.M.E. 1987, M.S.M.E. 1991, University of Sao Paulo; Ph.D. 1998,
University of Michigan

Homayun K. Navaz, Professor of Mechanical Engineering
B.S. Chemical Engineering 1980, Mississippi State University; M.S.
University of Michigan; Ph.D. 1985, Rice University

Thomas Ngniatedema, Assistant Professor
B.S. Applied Mathematics 2000, University of Yaounde; M.S.
Mathematics 2005, New Mexico State University; M.S. Industrial
Engineering 2007, Clemson University; Doctor of Philosophy, 2010/11,
Kent State University.

Karen I. Palmer, Associate Professor of Electrical Engineering
B.S.E.E. 1986, General Motors Institute; S.M.M.E. 1990, Ph.D. 1995,
Massachusetts Institute of Technology

Juan R. Pimentel, Professor of Computer Engineering
B.S.E.E. 1975, Universidad de Ingenieria, Peru; M.S. 1978, Ph.D. 1980,
University of Virginia

Ahmad Pourmovahed, Professor of Mechanical Engineering
B.S. 1977, Arya-Mehr University of Technology, Iran; M.S.M.E. 1979, Ph.D.,
1985, University of Wisconsin-Madison

Bassem Ramadan, Associate Department Head, Mechanical Engineering,
Professor of Mechanical Engineering
B.E. 1984, Beirut; M.S. 1986, Ph.D. 1992, Michigan State University

Richard Rantilla, Adjunct
M.S., Material Science, Brown University

Matthew S. Sanders, Professor of Industrial Engineering
B.S. 1980, M.S. 1981 Indiana State University 1980; Ph.D. Texas Tech
University 1987

Peter L. Stanchev, Professor of Computer Science
M.S. 1972, Ph.D. 1975, D.Sc. Sofia University

Laura L. Sullivan, Professor of Mechanical Engineering
B.S. 1984, Arizona State; M.S.E. 1988, Ph.D. 1992, M.S.E. University of
Texas at Arlington

Mark G. Thompson, Professor of Electrical Engineering
B.S. 1976, M.S. 1977, Ph.D. 1980, Michigan State University

Mohammad Torfeh, Professor of Electrical Engineering
B.S. 1977, University of Isfahan; M.S. 1979, Ph.D. 1982, Wayne State
University

Etim Ubong, Associate Professor of Mechanical Engineering
M.S. June 1977, Friendship University, Moscow; Licentiate, 1985, Doctor
of Technology, 1989, Helsinki University of Technology, Finland

Ravi K. Warriar, Professor of Electrical Engineering
B.Sc. 1972, University of Calicut, India; M.S. 1980, Ph.D. 1985, University
of New Mexico

CONTACT INFORMATION

The information below provides contact information that you may need during your studies in the Kettering University graduate program. We invite you to contact the respective person(s) as required to address your questions or concerns.

Main Graduate Contact Information	(866) KU-GRADS / gradoff@kettering.edu
Admission/Application Status	Dyan Robinson: (810) 762-9788 / admissions@kettering.edu
Blackboard/Banner Web Questions	Helpdesk: (810) 237-8324 / helpdesk@kettering.edu
Course Withdrawal	Cheryl Respecki: (810) 762-7852 / respeck@kettering.edu
Department of Business - Graduate Course Advising	(810) 762-7969 / business@kettering.edu
Enrollment Verification	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Financial Aid Office	(810) 762-7859 / finaid@kettering.edu
Financial Standing/Tuition payments/Receipts/Tax Info	Student Accounts Office: (810) 762-9552/ studentaccounts@kettering.edu
Grades	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Graduate Assistantship	Bonnie Switzer: (810) 762-7953 / bswitzer@kettering.edu
Graduation Information	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Incomplete Grades/Status	The course professor / see course syllabus
Kettering University Online	Angie Spade: (810) 762-9827 / KUOnline@kettering.edu
Registration Information	Cheryl Respecki: (810) 762-7852 / crespeck@kettering.edu
Student Change of Name, Address, Info	Cheryl Respecki: (810) 762-7852 / crespeck@kettering.edu
Technical Support	Helpdesk: (810) 237-8324 / helpdesk@kettering.edu
Testing out of pre-requisite course	Contact course department
Transcript Request	Registrar's Office: (810) 762-7476 / registrar@kettering.edu
Transfer Credits	Bonnie Switzer: (810) 762-7953 / bswitzer@kettering.edu
VA Benefits	Michelle Smith: (810) 762-9912 / msmith@kettering.edu

COURSES A-Z

Accounting (ACCT)

ACCT-639 Managerial Accounting 4 Credits

Prerequisites: ACCT-518

The use of managerial accounting information for planning and control will be studied. Case studies emphasize the role of accounting information in the decision making process. Designing, implementing, and the use of planning and control systems to achieve the firm's strategies are emphasized. Ethics issues are also addressed throughout the course.

Lecture: 3, Lab 0, Other 1

Business (BUSN)

BUSN-659 International Business 4 Credits

Prerequisites: None

An overview of the expanding role of international business in the world marketplace is provided. Emphasis is placed on exploring the complex issues relating to the best practices in International Business. This course will use case studies to illustrate the major topics.

Lecture: 4, Lab 0, Other 0

BUSN-689 Organizational Behavior 4 Credits

Prerequisites: MGMT-639

A comprehensive examination of different organizational behavior theories will be conducted including the analysis at individual, group and organizational levels. Individual levels include perception, personality, and motivation. Group levels will include decision making, group dynamics and team building. Organizational levels will include communications, empowerment, leadership, diversity and cross-cultural issues. Experiential activities will include class exercises such as case studies, videos, and survey instruments as well as team and individual assignments.

Lecture: 4, Lab 0, Other 0

BUSN-779 MBA Capstone: Innovation & New Ventures 4 Credits

Prerequisites: MGMT-659

This capstone focuses on the creation or startup of a new organization based on an innovation in product, process or delivery. Particular emphasis is placed on creating a new products or services in response to a human need, testing at several stages of the new product development process, gaining initial customers, gaining distribution, obtaining financial support and managing the new organization. This is a "hands on" course where students will actually develop some new product idea and/or prototype, conduct various types of market research and write initial business plans. The course is flexible to support students interested in a variety of fields.

Lecture: 4, Lab 0, Other 0

Computer Engineering (CE)

CE-612 Digital Systems Design 4 Credits

Prerequisites: None

The principles and practices used in the design of modern complex combinational and sequential digital systems are covered in this course. Digital logic design, analysis, simulation, and implementation techniques are covered. Fundamental algorithms underlying computer-aided design (CAD) tools are studied. Schematic diagrams, hardware description languages (HDL), and system-on-programmable chip (SoPC) design tools are used to specify designs targeted for implementation in technologies ranging from discrete ICs to programmable logic devices, ASICs and SoPCs. Topics in testing of logic circuits and hardware-software co-design will be covered. The course is accompanied by laboratory component that allows students to exercise the principles and practices learned.

Lecture: 3, Lab 2, Other 0

CE-620 Microcomputer Systems 4 Credits

Prerequisites: None

The architectural features, design principles, development tools and techniques of advanced embedded microcomputers are covered in this advanced level course. The topics include architectures of contemporary 16-bit and 32-bit RISC microcontrollers (considering Microchip PIC24 and PIC32 as example cases for the practical development experiences), instruction set, addressing modes, software development & debugging, parallel and serial interfacing, interrupts, timer module, ADC module, etc.; The course has a strong laboratory component, which will be carried out on a microcomputer development kit with the latest family of 16-bit and 32-bit microcontrollers. Students will also complete independent projects or research assigned by the instructor on topics such as low-power micro architectures and power-aware computing.

Lecture: 3, Lab 2, Other 0

CE-622 Computer Architecture and Organization 4 Credits

Prerequisites: None

Fundamental concepts in computer architecture and organization are presented. Laboratory assignments using VHDL simulation are a major portion of the course. Topics include fixed point and floating point computer arithmetic; assessing and understanding performance; control unit design; microprogramming; memory organization; cache design; a 32-bit instruction-set architecture; single-cycle, multicycle and pipelined CPU architectures; RISC architecture; examples of commercial computer architectures. An independent study or project will be completed.

Lecture: 3, Lab 2, Other 0

CE-624 VLSI Design 4 Credits

Prerequisites: None

Design techniques and basic theory of integrated circuit design are discussed. Topics include review of the semiconductor physics associated with NMOS and PMOS transistors; fabrication process; CMOS combinational circuits; memory cells; stick diagrams; layout techniques using CAD tools; circuit extraction and analysis. An advanced project is completed.

Lecture: 3, Lab 2, Other 0

CE-626 Real-Time Embedded Systems 4 Credits

Prerequisites: None

Implementation and applications of real-time embedded computers are studied. Topics include the case study of an embedded real-time operating system, typical applications of embedded computers, real-time hardware and software interfacing, and real-time scheduling algorithms. This course includes a lab component with several short design projects and research-oriented final project.

Lecture: 3, Lab 2, Other 0

CE-630 Logic Systems 4 Credits

Prerequisites: None

Introduction to several types of logic systems and their applications will be covered. Topics in asynchronous logic are covered, including design and analysis of asynchronous sequential networks, races, and various types of hazards. The course also covers ladder logic and its implementation in programmable logic controllers. Additionally, an introduction to fuzzy logic is studied, including membership functions, rule creation and evaluation, and applications. This course has a laboratory component that allows students to implement the various logic systems in hardware and software, culminating in a directed design project.

Lecture: 3, Lab 2, Other 0

CE-642 Mobile Robotics 4 Credits

Prerequisites: None

Fundamentals of robotics with an emphasis on mobile robots, which are intelligent integrated mechanical, electrical and computational systems functioning in the physical world will be covered. Topics include state-of-the-art technologies in mobile robotics, such as locomotion, sensing, control, communication, localization, mapping, navigation, etc. Advanced topics such as coordination of multiple mobile robots will also be explored. The course aims to provide both theoretical and practical experience to students through lectures and hands-on experience with real robots and simulation software. Students will also complete independent projects or research on current topics covering mobile robotics technologies and related fields.

Lecture: 3, Lab 2, Other 0

CE-660 Massively Parallel Processors 4 Credits

Prerequisites: None

Massive parallel processors utilizing hundreds of processing cores, those typically used as graphics processing units, for general purpose scientific computing will be taught in this introductory course. Topics include the architectural differences between a GPU and a traditional CPU, decomposing problems to efficiently utilize GPUs, and performance optimization techniques, and case studies. This course contains a research project that allows the student to identify a data-parallel algorithm and compare the performance of its CPU and GPU implementations.

Lecture: 4, Lab 0, Other 0

CE-670 Haptic Systems 4 Credits

Prerequisites: None

The required theoretical and practical background to design and development of haptic systems is provided in this course. Haptic technology enables computer users to touch and/or manipulate virtual or remote objects in simulated environments or tele-operation systems. This course aims to cover the basics of haptics through lectures, homework, lab assignments, a term project, and readings on current topics in haptics. Through lab assignments, students learn to create haptic-enabled virtual environments using a haptic device. Topics include current haptic technology and devices, the human haptic system, human haptic perception and psychophysics, haptic rendering of virtual objects. Students will be required to complete projects or independent review of research topics with approval of the instructor.

Lecture: 3, Lab 2, Other 0

CE-680 Computer Networks 4 Credits

Prerequisites: None

Organization, analysis, and design of interconnected systems of computers are studied. Topics include the Open System Interconnection model; the Internet reference architecture; network topology; media types; protocols; Ethernet; routing; TCP/IP; HTTP, wireless and mobile networks, multimedia Internet, industrial networks; and Internet applications. Students will be required to complete projects or independent review of research topics with approval of the instructor.

Lecture: 3, Lab 2, Other 0

CE-682 Computer Embedded Systems 4 Credits

Prerequisites: None

The most important topics in embedded systems operating in a network environment are addressed in this course. Topics include: typical applications of distributed embedded systems, control systems, real-time embedded software, microcontrollers, sensors, actuators, rapid prototyping, network-based software, and dependability concepts. A complete commercial hardware and software development environment that supports rapid prototyping and debugging is used in laboratory assignments and a term project to develop a complete distributed embedded application. Students will be required to complete projects or independent review of research topics with approval of the instructor.

Lecture: 3, Lab 2, Other 0

CE-691 Computer Engineering Special Topics 4 Credits

Prerequisites: None

Graduate level Special Topics in Computer Engineering.

Lecture: 4, Lab 2, Other 0

CE-695 Graduate Research in Computer Engineering 1-8 Credits

Prerequisites: None

This course is directed research towards a master's thesis. Students must take this course under the direction of a faculty advisor, and it is graded pass or fail. This course may be repeated for credit.

Lecture: 6, Lab 2, Other 0

CE-699 Computer Engineering Independent Study 4 Credits

Prerequisites: None

Terms Offered: As needed

Graduate level Independent Study in Computer Engineering

Lecture: 4, Lab 0, Other 0

Computer Science (CS)

CS-699 Computer Science Graduate Level Independent Study Course 4 Credits

Prerequisites: None

Terms Offered: As needed

Graduate level Independent Study.

Lecture: 4, Lab 0, Other 0

Economics (ECON)

Elect. & Computer Engrg (ECE)

ECE-610 Modeling of Dynamic Systems 4 Credits

Prerequisites: None

Modeling, simulation, and analysis of multivariable dynamic systems are covered in this course. Increasingly, practitioners are called upon to develop and to analyze realistic mathematic models of electromechanical or other dynamic systems. Approaches to modeling a variety of dynamic physical systems are discussed using examples of dynamic systems taken from a variety of fields. These systems are simulated using appropriate simulation tools. Most of the course is devoted to the analysis of linear systems using now classical techniques: linear algebra, state-space representations, and the state transition matrix. The material on nonlinear systems emphasizes modeling and simulation. Course work in linear algebra and difference and differential equations is a prerequisite for this course.

Lecture: 4, Lab 0, Other 0

ECE-630 Advanced Digital Signal Processing 4 Credits

Prerequisites: EE-434 and MATH-408

Principles of optimum filtering, signal analysis, and spectral estimation are presented. Topics include: review of signal processing systems, the Discrete Fourier Transform, the Fast Fourier Transform, digital filter structures, optimum filters, multirate signal processing, adaptive signal processing, linear prediction, vibration analysis, wavelet theory, and signal processing applications.

Lecture: 4, Lab 0, Other 0

ECE-642 Electric Machine Drives 4 Credits

Prerequisites: EE-342 and EE-424

Methods of controlling electric machines and their applications are discussed. Topics include solid-state devices; various switching schemes; types of drives; characteristics of motors; controlling motors including vector control; braking of motors; and dynamics of electric drives and applications.

Lecture: 4, Lab 0, Other 0

ECE-648 Electromagnetic Compatibility 4 Credits

Prerequisites: None

In-depth classical and currents topics in the field of electromagnetic compatibility (EMC) are studied in this course. This includes signal integrity, high-speed digital design matching techniques, passive filter design, single and multilayer shielding, electrostatic discharge, high-frequency measurements, circuit board layout, and grounding methodology. Basic course work in electromagnetic compatibility is a prerequisite for this course.

Lecture: 4, Lab 0, Other 0

Electrical Engineering (EE)

EE-691 Graduate Special Topics in EE 4 Credits

Prerequisites: None

Terms Offered: As needed

Graduate Level Special Topics in Electrical Engineering.

Lecture: 4, Lab 0, Other 0

EE-695 Graduate Research in Electrical Engineering 1-8 Credits

Prerequisites: None

Terms Offered: As needed

This course is directed research towards a master's thesis. Students take the course under the direction of a faculty advisor. This course may be repeated for credit.

Lecture: 8, Lab 0, Other 0

EE-699 Graduate Level Independent Study in Electrical Engineering 8 Credits

Prerequisites: None

Terms Offered: As needed

Graduate level Independent Study in Electrical Engineering.

Lecture: 8, Lab 0, Other 0

Financial (FINC)

FINC-619 Financial Management 4 Credits

Prerequisites: ACCT-518

The performance of the financial management role in a firm is provided in this course. The first half of the course focuses on the theoretical valuation of stocks and bonds and the capital markets in which they are traded. The second half of the course focuses on both the use of financial leverage by the firm and working capital management. The need for financial managers to provide both ethical and legal leadership for the firm is stressed throughout the course.

Lecture: 4, Lab 0, Other 0

Indust/Manufctrng Engrg (IME)

IME-601 Fundamentals of Manufacturing Engineering 4 Credits

Prerequisites: None

A general overview of the field of Manufacturing Engineering is provided in this course. Topics introduced include: various manufacturing processes, materials, quality assurance, quality control, safety, ISO/QS 9000, process and facilities planning, project management, and lean manufacturing. This course is delivered entirely via the internet.

Lecture: 3, Lab 0, Other 1

IME-603 Numerical Control Machining 4 Credits

Prerequisites: IME-301

The fundamentals of computer numerical control (CNC) programming and computer-aided manufacturing (CAM) are introduced in this course. The fundamental theoretical and operational concepts of machining are also presented. The course focuses on the programming of cutting operations; tool materials, selection, and uses. Significant topics include: G-code programming, Introduction to CAM software, Taylor's tool life model, Criteria for tool selection, and the Orthogonal Cutting Model. Laboratories use CNC machine tools for programming and cutting, and are designed to illustrate theoretical concepts and methods for solving practical engineering machining problems.

Lecture: 3, Lab 2, Other 0

IME-652 Designing Value in the Supply Chain 4 Credits

Prerequisites: None

Students gain an understanding of the decision-making tools necessary to design value in the global supply chain from concept to customer. Quantitative methods are employed to aid the decision-making process of demand forecasting and enterprise planning for the purpose of increased profit and value to stakeholders. Basic concepts in strategy, forecasting, demand planning, inventory control and value stream mapping will be taught and utilized to enable the decision-making process to be based on quantitative metrics.

Lecture: 3, Lab 0, Other 1

IME-654 Enterprise Resource Planning 4 Credits

Prerequisites: None

An understanding of the integrated approach to enterprise planning and its evolution from MRP I and MRP II is provided in this course. It describes the core structure of ERP systems and highlights the characteristics of emerging ERP based organizations. Various ERP tools and techniques are described and compared. The fundamental success factors in moving from traditional business functions to an integrated process-based ERP environment are introduced.

Lecture: 3, Lab 0, Other 1

IME-660 Design for Manufacture and Assembly 4 Credits

Prerequisites: IME-601

A study of the current methodologies associated with product design for manufacture and assembly. Topics include DFMA overview, Design for Function, Design for Assembly Principles, BDI-DFA Manual Methodology, Creative Concept Development, and Concept Selection Methodologies. Note: Students who have taken IME-474, Design for Manufacture or its equivalent are not eligible to enroll in this course but must substitute another engineering course approved by their faculty advisors.

Lecture: 3, Lab 0, Other 1

IME-674 Quality Assurance and Reliability 4 Credits

Prerequisites: (IME-605 or MATH-605)

The topics in quality assurance are covered in this course. Specifically, it includes introduction to quality and quality philosophy, statistical methods of quality improvement, concept of variation and its reduction, statistical process control, and acceptance sampling. Statistical software such as MINITAB is used throughout the course. Terms Offered: At least once on a live/tape basis and the rest via tape-delay basis. This is out of necessity and flexibility expected of the master's program.

Lecture: 3, Lab 0, Other 1

IME-676 Lean Six Sigma 4 Credits

Prerequisites: None

This techniques to maximize production efficiency and to maintain control over each step in the process are examined in this course. The structured problem-solving methodology DMAIC (Define-Measure-Analyze-Improve-Control) will provide the framework for the course.

Lecture: 3, Lab 0, Other 1

IME-680 Computer Integrated Manufacturing 4 Credits

Prerequisites: IME-601

CIM is defined with current terminology and recent concepts. It includes the relationships among the three major functions - design, manufacturing and business. CIM examples, obstacles to development and future trends are covered. Flexible manufacturing is highlighted. Key components of CIM are explored with special emphasis on robotic automation and control through interaction with the environment, CAD-CAM link with numerical control, computer supervisory control, process planning and quality assurance. Concurrent Engineering will be used in process and product quality selection. Lean manufacturing principles will be applied. Communication and networking, the artery of CIM, will be studied in the context of data compatibility and hierarchical control. Manufacturing analysis tools will be used to plan and implement a CIM system.

Lecture: 3, Lab 0, Other 1

Information Systems (ISYS)

ISYS-669 Enterprise Information System Models 4 Credits

Prerequisites: None

An overview of information systems (IS) viewed at two levels: the strategic role of IS and a process-oriented view of the organization and its relationships with suppliers, customers, and competitors. We view processes as vehicles for achieving strategic objectives and transforming the organization. The major focus of the course is how organizations implement processes globally using enterprise resource planning (ERP), supply chain management (SCM), customer relationship management (CRM) Product Lifecycle Management (PLM) and social networks. The course also provides a brief IS infrastructure overview and addresses key IS management topics. Students learn about the ethical and legal implications of information systems.

Lecture: 4, Lab 0, Other 0

Kettering Inter-Discipln (KETT)

Lean/Manufacturing Ops (MFGO)

MFGO-601 Globally Integrated Manufacturing Company 4 Credits

Prerequisites: None

Integrated overview and introduction to contemporary global manufacturing operations. The focus of this course is the application of attitudes, skills, and knowledge required of managers, supervisors, and team leaders and manufacturing professionals in a cross-functional and cross-cultural manufacturing operation. After a brief historical overview of global, manufacturing, this course covers the following topics: global leadership, cross-cultural business communication, customers-across-continent, empowerment and cross-cultural teamwork, continuous process improvement, manufacturing metrics, policy deployment, ISO and QS 9000, computer integrated manufacturing, process re-engineering, international supply chain management, and theory of constraints. This foundation leads up to a discussion on the lean and agile manufacturing management. Students are required to use the concepts from the class to analyze their own work environment.

Lecture: 3, Lab 0, Other 1

MFGO-619 Six Sigma for Manufacturing 4 Credits

Prerequisites: None

Techniques to maximize production efficiency and to maintain control over each step in the process will be examined in this course. The structured problem-solving methodology DMAIC (Define-Measure-Analyze-Improve-Control) will provide the framework for the course. Lecture: 3, Lab 0, Other 1

MFGO-633 Lean Production Systems 4 Credits

Prerequisites: (MFGO-601 and MFGO-619) or (MATH-408 or MGMT-521) and IME-601

Minimum Class Standing: NA

Terms offered: Fall, Spring

This course starts from the discussion of the evolution of the production systems, from craft to mass and to lean production. Principles of systems thinking and business dynamics applied to production systems are also studied. Contemporary lean thinking principles, lean enterprise development, and value stream mapping are studied and used in student projects. Modern enterprise improvement techniques such as Six Sigma, Theory of Constraints and Business Process Reengineering are also discussed.

Lecture: 3, Lab 0, Other 1

MFGO-635 Work Analysis for Lean Production Application 4 Credits

Prerequisites: MFGO-633

A critical issue facing most manufacturers of a product is the design of a competitive and low-cost manufacturing operation. In this course, work analysis will consist of the application of process analysis, methods improvement, and work measurement and ergonomic techniques to meet the competitive goals of a manufacturing company or office environment. The intent of this course is to survey the basic techniques of methods design, work measurement, business process analysis, and ergonomics. The student will be expected to solve fundamental and open-ended problems encountered during the design, analysis, or operation of a manufacturing facility (or an office) that produces a discrete product (or service).

Lecture: 3, Lab 1, Other 0

MFGO-639 Quality Assurance and Reliability 4 Credits

Prerequisites: None

Topics in quality assurance are covered in this course. Specifically, it includes introduction to quality and quality philosophy, statistical methods of quality improvement, concept of variation and its reduction, statistical process control, and acceptance sampling. Statistical software such as MINITAB is used throughout the course.

Lecture: 3, Lab 0, Other 1

MFGO-649 Metrics for Lean Production Improvement 4 Credits

Prerequisites: MFGO-635 or MFGO-639

The manufacturing operations professional will be provided an understanding of the data typically available within a manufacturing environment and how to use this information for improving those operations within the lean paradigm. Basic financial accounting, activity based metrics, links to strategy, trend analysis and decision making will be covered. Student teams operate simulated companies in competition with other student teams to gain experience in applying the concepts taught.

Lecture: 3, Lab 0, Other 1

MFGO-659 Integrative Capstone Project 4 Credits

Prerequisites: MFGO-649

The course will establish a business-focused, project-oriented perspective applicable to the integrated manufacturing operating (IMO) environment. Learning about the principles and techniques that are within the discipline of Project Management will involve a focus on the body of knowledge recognized by the Project Management Institute. The IMO environment will be the basis for projects by student teams as they integrate their knowledge gained from other courses and professional experience. The project requirement is expected to enable students to apply the Project Management concepts and techniques learned in the class. In summary, this course will assist the students to become knowledgeable about and practice Project Management, its applications, and limitations.

Lecture: 3, Lab 0, Other 1

Management (MGMT)

MGMT-609 Technology Management 4 Credits

Prerequisites: None

An overview of Management of Technology and Innovation (MTI) and its impact on contemporary management practices is covered. The focus of the course is on the application of skills and knowledge required of managers and technology professionals responsible for technology implementation in a product development environment. The course analyzes the critical aspects of the management of technology and innovation at the product line, business unit, and corporate levels. Case studies and simulations are used to bring to life the critical challenges confronting managers of technology.

Lecture: 4, Lab 0, Other 0

MGMT-619 Project and Change Management 4 Credits

Prerequisites: ACCT-518

Managing projects within an organizational context, including the processes related to initiating, planning, executing, controlling, reporting, and closing a project are covered in this course. Project integration, scope, time, cost, quality control, and risk management. Managing the changes in organizations resulting from introducing or revising information systems. Identifying project champions, working with user teams, training, and documentation. The change management role of the IS specialist.

Lecture: 4, Lab 0, Other 0

MGMT-629 Management Science 4 Credits

Prerequisites: MATH-408 or MGMT-521

A variety of quantitative techniques to facilitate the decision-making process are provided to the manager in this course. Both optimization techniques such as linear programming and stochastic techniques such as waiting-line models and Markov processes are covered. Emphasis is placed on the application of these quantitative techniques to a variety of managerial decision areas.

Lecture: 4, Lab 0, Other 0

MGMT-639 Managing People & Organization 4 Credits

Prerequisites: MGMT-550

Students are prepared for management positions in high tech and manufacturing companies. In this overview course, students will be introduced to the most important concepts and issues concerning the management and leadership of high technology staff. Subjects include high tech leadership and communication, change management, lean thinking, HR issues, ethics and persuasion.

Lecture: 4, Lab 0, Other 0

MGMT-649 Ethics and Leadership 4 Credits

Prerequisites: MGMT-639

Students are prepared for leadership roles in the workplace and in society by giving them knowledge of management and leadership from an ethical perspective. This course will focus on the evolution of ethical theories and the role of the leader within the business context. Students will use their understanding of business, leadership and the processes of moral reasoning to examine contemporary issues relating to organizations. Through lecture and case method, students will apply their knowledge of leadership to contemporary situations.

Lecture: 3, Lab 0, Other 1

MGMT-659 Strategy 4 Credits

Prerequisites: BUSN-659 and FINC-619 and MGMT-639 and MRKT-679

The capstone business class focuses on the formulation, implementation, and evaluation of organizational policy and strategy from the perspective of the senior manager/strategy planner. Consideration is additionally given to information technology, global operations, ethics, legal perspectives and the functional level strategies of the organization. An integrative approach uses the case method to explore executive decision making in the global marketplace.

Lecture: 4, Lab 0, Other 0

MGMT-661 Operations Management in Service Organizations 4 Credits

Prerequisites: MATH-408 or MGMT-521 or MFGO-619

An exposure to and an understanding of the core concepts and tools of operations management are provided in this course. These concepts and tools will be presented in a manner that will allow students to understand the fundamental importance of coordinated operational activities.

The class will examine how to effectively integrate operations across all functional areas of the organization in delivering the combination of service and manufactured value required to satisfy customers.

Recognition of the importance of adding value and customer satisfaction to the long-term viability of both for-profit and not-for-profit firms will be emphasized.

Lecture: 4, Lab 0, Other 0

MGMT-669 Supply Chain Operations 4 Credits

Prerequisites: None

A conceptual framework for understanding Supply Chain Management (SCM) is provided. The course covers concepts, trends and technologies that enable global SCM. Students will learn how customer needs, competitive advantage, operational measures and financial performance support successful implementation of SCM. They will also learn how operational activities including information systems, procurement, demand planning and forecasting, inventory management and logistics support organizational goals. Students will use software and case studies to illustrate concepts.

Lecture: 4, Lab 0, Other 0

MGMT-679 Leadership 4 Credits

Prerequisites: None

A comprehensive examination of different leadership theories, with emphasis on relevant empirical evidence and application of the theories to case studies that involve leadership and group functioning are covered in this course. Students will thoroughly examine a professional review of concepts and apply their understanding through a variety of means. Ethics and persuasion are covered.

Lecture: 3, Lab 0, Other 1

Marketing (MRKT)

MRKT-679 Marketing Management 4 Credits

Prerequisites: MRKT-570

An overview of marketing's role in connecting businesses to other businesses is provided in this course. While this course will cover the basic Business Management topics, a special emphasis is placed on the best practices in market relationship management, supply chain management, and strategy development. Cases will be used throughout the course to illustrate various concepts and issues.

Lecture: 4, Lab 0, Other 0

Mechanical Engineering (MECH)

MECH-600 Engineering Mathematics with Applications 4 Credits

Prerequisites: (MATH-305 or MATH-307) and MECH-420

The objectives of this course are to introduce students to various analytical and numerical methods used in the modeling, analysis, and design of engineering systems. The theory and application of these methods will be introduced. Applications to real-world mechanical and thermal-fluid systems will be performed.

Lecture: 3, Lab 0, Other 1

MECH-610 Mechanics of Materials I: Linear Elasticity 4 Credits

Prerequisites: None

Introduction to the general model of deformation and displacements; and, their application to linear elastic solids are taught in this course. The formulation of deformation gradients, displacement gradient, strain, and stress tensors will be discussed. The derivation of the general equation of motion of a deforming solid will be conducted. The general constitutive relation of elastic materials will be introduced. The linearized general deformation measures and constitutive relation will be utilized with the general equation of motion and compatibility conditions to develop the general theory of linear elasticity. The developed theory will then be applied to solve for the deformation and stresses of elastic solids under plane strain, plane stress and beam theory conditions.

Lecture: 3, Lab 0, Other 1

MECH-611 Mechanics of Material II: Nonlinear Elastic-Plastic Behavior 4 Credits

Prerequisites: MECH-610

General nonlinear theory of deformation and its application to elastic-plastic behavior of materials is taught in this course. The linear elastic behavior will be reviewed along with its application to deformation of plates and shells. The geometric nonlinear deformation measures will be discussed. The application of the general equation of motion to nonlinear deformation of solids will be conducted. The nonlinear theories of elasticity and plasticity materials will be introduced. The nonlinear deformation measures and constitutive relation will be utilized with the general equation of motion to address the nonlinear deformation of elastic-plastic materials. The developed relations will then be applied to solve for the deformation and stresses of several nonlinear problems.

Lecture: 3, Lab 0, Other 1

MECH-613 Nonlinear Finite Element Analysis 4 Credits

Prerequisites: MECH-611

Introduction to the theory and application of nonlinear finite element analysis in engineering design is covered in this course. The classification and formulation of different nonlinear behaviors and computational techniques will be discussed. Material and geometric nonlinear behaviors will be studied. The computational techniques for solving the different classes of nonlinear problems will be formulated. These techniques include implicit and explicit methods. Commercial software will be used to apply the formulated algorithms to the analyses of nonlinear crash and metal forming engineering problems.

Lecture: 3, Lab 0, Other 1

MECH-615 Engineering Optimization 4 Credits

Prerequisites: MECH-600

Introduction to the general model of numerical optimization and its application to engineering design. The formulation and classification of the optimization problems will be discussed. The computational search techniques for solving the different classes of optimization problems will be studied. These techniques include single and multivariable, zero and first order constrained and unconstrained, linear and nonlinear search algorithms. The developed algorithms will be used to find the optimum solutions for a variety of engineering design problems.

Lecture: 3, Lab 0, Other 1

MECH-621 Applied Transport Phenomena 4 Credits

Prerequisites: MECH-420

Introduction to concepts normally not covered in undergraduate Heat Transfer and Fluid Flow courses. Concepts relating to advanced heat convection and mass diffusion, turbulent and laminar boundary layer flows with heat transfer and mass transfer will be introduced. Topics in advanced heat conduction and droplet evaporation will also be introduced. Heat transfer for internal and external flow problems will be considered. The relationship between fluid flow, heat, and mass transfer in engineering systems will be discussed. Analytical and approximate solutions to these problems will be presented.

Lecture: 3, Lab 0, Other 1

MECH-622 Computational Heat and Mass Transfer 4 Credits

Prerequisites: MECH-600

Introduction to the use of numerical methods that are commonly used to solve transient, non-linear, three-dimensional engineering problems with complicated geometries. Analytical methods that could be used to solve these types of problems will be presented. Some of these analytical methods can only be used to solve problems with simple geometries and simple boundary conditions. However, numerical methods can be used to solve problems with complicated geometries and boundary conditions. Engineering problems involving several different physical phenomena simultaneously, such as fluid flow with heat transfer and mass transfer, will be considered. In this case, the governing differential equations are coupled and should be solved simultaneously. Methods on how to treat non-linear terms will be discussed. Moreover, the method of staggered grids and upwind schemes that are used to solve fluid flow problems will be presented. For transient problems, implicit and explicit methods will also be presented. The student will be required to write his or her own computer code to implement these methods to solve engineering problems. For very complicated geometries, the student will be required to use a commercial or existing code. The student will be able to relate the computer output to the performance/behavior of the physical system. The limitations and convergence/stability issues associated with these numerical methods will be discussed.

Lecture: 3, Lab 0, Other 1

MECH-626 Hydrogen Generation, Storage and Safety 4 Credits

Prerequisites: None

This various methods of hydrogen production are covered: water electrolysis using photovoltaics, steam reformation and partial oxidation techniques of various types of conventional and alternative fuels. Various methods of hydrogen storage – compressed gas, liquefied gas, metal and chemical hydrides and nanotubes are included. Codes for underground and above ground pressurized hydrogen gas storage systems and safety aspects are covered. A comparison is made between hydrogen properties and known conventional fuels such as, methane (natural gas), gasoline, methanol and ethanol. Infrastructure design studies, dispensing transportation, codes and standards are covered. A hydrogen storage/production/safety laboratory for experimental studies is planned to be a major component of this course.

Lecture: 3, Lab 0, Other 1

MECH-627 Green Energy Conversion 4 Credits

Prerequisites: MECH-420

Radiant energy transfer from the sun and its application to solar exchangers are covered. Basic theory, energy balances for solar exchangers, economics, and practice of solar energy applications are included. The concepts are applied to renewable energy systems such as solar heating and cooling systems for homes, businesses, and industry. Windmill theory and applications as well as system design are also covered. Data obtained on large scale solar and windmill systems will be analyzed and discussed.

Lecture: 3, Lab 0, Other 1

MECH-641 Combustion & Emissions 4 Credits

Prerequisites: MECH-420

Introduction to the basic principles of combustion and how to apply them to basic engineering problems. Various technologies of this field will be explored. However, a large portion of the course will cover the fundamentals of combustion. Topics relating to flame speed, flame thickness, flame spread, flame quenching, blow-off, stabilization, ignition energy, flammability limits, and flashback will be presented. Laminar and turbulent premixed and diffusion flames will be discussed. These topics will be related to combustion and emissions in spark-ignition and diesel engines.

Lecture: 3, Lab 0, Other 1

MECH-643 Noise, Vibration & Harshness 4 Credits

Prerequisites: None

An integrated approach to the analysis of Noise, Vibration and Harshness of automotive engineering is presented. Techniques for evaluating the vibration and acoustic characteristics of vehicle systems are discussed. Then the principles of noise and vibrations control are presented through automotive applications.

Lecture: 3, Lab 0, Other 0

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